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Miami valley, Ohio

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NATURAL

AND

STATISTICAL VIEW,

OR

PICTURE OF CINCINNATI

AND THE

MIAMI COUNTRY,

ILLUSTRATED BY MAPS.

WITH AN

APPENDIX,

CONTAINING

OBSERVATIONS ON

The late Earthquakes, the Aurora Borealis, and South-west Wind.

BY DANIEL DRAKE.

CINCINNATI:
PRINTED BY LOOKER AND WALLACE.
1815.

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District of Ohio, to wit.

BE IT REMEMBERED, that on the sixth day of September, in the year of our Lord one thousand eight hundred and fifteen, and in the fortieth year of the independence of the United States of America, Daniel Drake, of the said district, hath deposited in this office the title of a book, the right whereof he claims as author, in the words following, to wit:

"Natural and Statistical View, or Picture of Cincinnati and "the Miami country, illustrated by maps. With an Appendix, "containing observations on the late Earthquakes, the Aurora "Borealis and South-west Wind. By Daniel Drake."

In conformity to the act of congress of the United States, entitled "An act for the encouragement of learning, by securing the copies of maps, charts and books, to the authors and proprietors of such copies, during the times therein mentioned," and also of the act entitled "An act supplementary to an act entitled 'An act for the encouragement of learning, by securing the copies of maps, charts and books, to the authors and proprietors of such copies, during the times therein mentioned, and extending the benefit thereof to the arts of designing, engraving and etching historical and other prints.'"

A copy—attest, HUMPHREY FULLERTON,
Clerk Ohio District

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TO

LIEUTENANT-COLONEL JARED MANSFIELD,

PROFESSOR OF NATURAL AND EXPERIMENTAL PHILOSOPHY IN THE UNITED STATES' MILITARY ACADEMY.

DEAR SIR—

I trust you will pardon my inscribing to you, without permission, the following work; when I avow that my chief inducement for using your name, is the opportunity it affords, of expressing the unmingled pleasure with which I cherish the recollection of your instructive converse, while sojourning, with your family, in the vicinity of Cincinnati.

How long a time must elapse before we shall again enjoy such enviable society;—or at what future period the Miami country will be prepared for the reception and permanent residence of learning and philosophy, it would be venturesome at this time to predict. In the mean while, it is consoling to reflect, that, in our arduous ascent to the exalted level of our elder sisters, we have the good wishes of their most liberal and enlightened citizens; among whom your numerous friends in this quarter, will never fail to assign you an elevated and conspicuous rank.

With sentiments of true and respectful attachment,
I am, dear sir,
Your obedient friend and servant,
DANIEL DRAKE.

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PREFACE.

In the year 1810, the Author of the following work, composed a pamphlet on the Topography, Climate and Diseases of Cincinnati; a few copies of which were printed and distributed, chiefly, among his medical and scientific friends, for whom only it was designed. The perusal of it, however, was not confined to them; and several applications were made to obtain copies for the use of travellers in quest of information concerning this country. It was these applications which, two years ago, suggested the advantage that would result from a more extended, and less professional work, of a similar kind; and a prospectus was accordingly sent abroad. For more than a year, it remained doubtful whether sufficient patronage would be afforded to warrant the risk of publication; and as this was an indispensable prerequisite, the preparation of the manuscript was consequently suffered to languish. The causes which have since deferred its completion, are many and imperious; but as they no longer interest the public, it would be useless to detail them.

With respect to the subjects which co[illegible] the book, it may be observed, that an acco[illegible]

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a village in the woods, necessarily differs from that of a populous city, as widely as their landscapes vary from each other. The former dwells on natural objects and advantages; while the latter exhibits the progress of improvement, and expatiates on the works of art. They are, moreover, read for different purposes:—We desire to know what there is in a new country, that can recommend an emigration thither: in a city, we seek for that which is worthy of imitation or adoption. Thus the PICTURE OF CINCINNATI will be found to contain a larger proportion of natural history, than any of the works which have lately appeared east of *The mountains*, under similar titles. The author does not apprehend that this will diminish the value of the book, however unusual it may be considered; but he deeply regrets his not being able to assert that in this portion of the work there is that accuracy, fulness and perspicuity which the interests of science require. To those who are experimentally acquainted with the difficulties attending the acquisition of elementary knowledge in chemistry, geology, botany, and the other physical sciences—without apparatus, with but few books, and no arranged collections;—or even to those who have felt the minor embarrassments attending the practical study of these branches, without practical works, he need make no apology. In the other chapters, it is hoped, that not many exaggerations exist; as it has been the constant aim to write a history, and not ic. Still, as accidental associations ttachments, are liable to give an *undue*

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degree of meanness or excellence to many of the objects among which we have spent the greater part of our lives; he is unwilling to flatter himself that he has not made some statements which may be pronounced partial, or even erroneous. To point out these, is peculiarly the province of that domestic criticism, which he chooses to invite, rather than deprecate.

There may be readers who will consider the work as extending further, on some points, than can be justified by its title; but this impression would be erroneous. No subject is introduced that has not a connexion with the town, and were any such to be omitted, the plan would obviously be defective. A book of this kind should contain whatever it is desirable to know, concerning the spot of which it professes to treat. The *relations* of a town with the surrounding country, are an essential part of its history, and cannot be understood without studying both. The Author is by no means so confident, that he has adopted the best mode of exhibiting this information; and in giving it a formal distribution under the heads which have been employed for geographical delineations of greater extent, he does not expect to escape the charge of a precise and finical devotion to method; but with the hope, that the opportunity it afforded of disposing the materials in that state of arrangement which will facilitate a reference to any particular subject, he felt no disposition to pursue a different plan, merely to avoid so harmless a criticism. A more ample field for animadversion, will perhaps be found in the examination of his style. 'Tis true, the

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merit of a topographical work, composed chiefly of facts and observations, does not depend altogether on the choice and collocation of the words in which it is expressed; but still it is the sacred duty of every writer to improve, rather than corrupt his language. The Author performs, therefore, merely an act of justice to himself, when he declares that the imperfections in his style have arisen neither from indolence, nor contempt of public opinion, but from causes which lie beyond the sphere of his control; and at the same time, it is equally due to the reputation of his fellow townsmen, that he should protest against the reception of this performance as a fair specimen of their literature.

The map of the Miami country, which includes also the adjoining parts of Kentucky, so as to exhibit an entire view of the tracts dependent on Cincinnati as their emporium, has been compiled with much care by Mr. Thomas Danby, from the following materials, furnished him by the Author: 1. The correct and beautiful map of Ohio, published in 1807, by the late captain J. F. Mansfield, from the official returns in the office of the Surveyor General of the United States* ;—2. Transcripts from the plats in the office just mentioned, of such parts of this district as lie west of the state of Ohio ;—3. A manuscript map of the counties watered by the eastern branch of the Little Miami, procured from the Auditor of the

* The copyright of this map has lately been sold to Messrs. Hough & Borne, of Chillicothe; who have published a new and enlarged impression of it, with the addition of an accurate survey of the Virginia Military Reserve.

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State ;—4. A map of Campbell county, in Kentucky, furnished by General Taylor ;—and 5. Personal observation and research through most of the district, with oral and manuscript information from various persons. The plan of the town has been executed by the same gentleman, on a scale of 800 feet to an inch, from materials obtained chiefly at the office where the surveys of the town plat are recorded ; and has therefore all the accuracy which can be conveniently given to such a work. The plate representing geometrically the comparative temperatures of each month in the Atlantic and Western States, which was promised in the prospectus, has been omitted for want of the proper eastern observations.

The two first papers of the Appendix were read before the School of Literature & the Arts, in 1814; and have been extracted, by permission, from the register of that society. The third has already appeared in The Port Folio; but as only a small proportion of the inhabitants of the Miami country have an opportunity of reading that valuable Magazine ; and as the Author has collected some additional facts, he considered the reprinting of it not improper.

It only remains for the Author to make a public acknowledgement of obligation, to those gentlemen who have aided him by their communications, in the difficult and tedious business of collecting small facts ; and to those young friends, whose assistance, in the correction of the work, has brought it before the public in a more perfect condition than it would otherwise have attained.

Cincinnati, Ohio, September, 1815.

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CORRECTIONS AND ADDITIONS.

It will be seen in the first chapter, that the population of Kentucky for 1814 and 1820, is not what should result from the data given. Wrong numbers were transcribed from the table of prospective calculations—and the reader will please to substitute for them, 464,000 and 565,000. In the section devoted to a comparison between the climates of some portions of the Eastern and Western States, line 17 of page 124, the sentence "3. *The greater elevation of the interior region,*" is misplaced, and should be read immediately after the word "*Alleghenies,*" which closes the fourth line from the bottom of page 123. The Cincinnati Gazette has been discontinued, since the chapter in which it is announced was printed. To the catalogue of marine exuviæ there may, perhaps, be added one or two species of cardium, or cockle. The soft-shelled turtle, mentioned in treating of the climate, is the testudo ferox of Linnæus.

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PICTURE OF CINCINNATI.

CHAPTER I.

GEOGRAPHICAL AND HISTORICAL INTRODUCTION.

Section 1. OHIO RIVER.

The river Ohio is formed by the union of the Allegheny and Monongahela rivers at Pittsburgh, in latitude (according to Mr. de Ferrer) 40° 26′ 15″ north, and in longitude from Washington 2° 56′ west. It passes, for a short distance, through the state of Pennsylvania, and then constitutes the line of division between the states of Virginia and Kentucky on the south, and the state of Ohio, the Indiana and Illinois Territories on the north. In latitude 37° 00′ 21″ north, and longitude 11° 56′ 22″ west (from the mean observations of Ellicot and de Ferrer) it joins the Mississippi, having meandered in a west-south-west course upwards of 900 miles. The Allegheny, however, which, at its origin in the mountains of that name, interlocks with the Susquehanna and Genesee, and whose length may be estimated at 300 miles, is to be regarded as the Ohio under another name, making the entire length of this

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great river upwards of 1200 miles—almost three times the length of the Susquehanna, including the Chesapeake Bay, and four times the length of either the Potomac, Delaware, Hudson or Connecticut river. Its width, at Cincinnati, which is nearly equidistant from Pittsburgh and its confluence with the Mississippi, is 534 yards; which may be assumed as its mean breadth. Its annual range from low to high water, at the same place, is about 50 feet; the extreme range nearly 10 feet more. When lowest, it may be forded in several places above Louisville. The greatest depressions are generally in August, September and October; the greatest rises in December, March, May and June. Its mean annual temperature, 8 inches beneath the surface, at Cincinnati, is nearly 56 degrees; its greatest summer heat, 82 degrees, and its lowest winter heat, 32 degrees. Near Pittsburgh it is almost every winter frozen over for several weeks; this has even been the case more than 400 miles below that town. Generally the navigation upwards is suspended by floating ice during eight or ten weeks of the winter. Its current, when of a mean height, is estimated at three miles an hour; when higher, and rising, it is more; when very low, it does not exceed two miles. Its valley has the medium breadth of one mile; in some places it is contracted to half that width, and in others, as at the junction of the tributary streams, expanded to a mile and a half, or two miles.

It is generally serpentine, and presents to the eye of the voyager an uniform succession of hills and declivities, which display, in spring, the blooming elegance of a luxuriant garden; in summer, the rich verdure

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of a lofty and boundless forest; and in autumn, a splendid tissue of green, gold and crimson foliage. In winter, an occasional precipice, with a brow overhung by red cedars, exhibits considerable grandeur—but variety and sublimity are not predominant features of this scenery; and the pleasure it affords to the traveller of taste, is chiefly referable to its beauty, freshness and tranquility.

The Ohio contains about a hundred islands,* or one for every nine miles. In a space of one hundred miles, however, between the states of Kentucky and Ohio, there are none. A few of these islands are cultivated; many are too small and barren for advantageous improvement, and a large proportion are liable to occasional inundation. They form no serious obstruction to the navigation of the river, except in low water, when the bars and ripples connected with them, are somewhat dangerous.

There are but two considerable rapids. The first, called Le Tart's, is about 230 miles below Pittsburgh. It is a ripple caused by rocks—rather dangerous in low water, perceptible when the water is at a mean height, but not discoverable in moderate floods. The other, 360 miles below Pittsburgh, opposite the town of Louisville, called, by way of pre-eminence, the FALLS, has a descent of 22 1-2 feet in two miles. The bed of the river consists of stratified, level, limestone. In low water, loaded boats cannot descend; in a medium flood, they pass down in safety, under the direction of a pilot; in high water, an increased velocity of current is all

* See Cramer's Navigator.

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that is perceived. A company has been formed for opening a canal round these rapids, on the south side, and the preparatory operations are already commenced.

Among the southern tributary streams of the Ohio, the principal are the Monongahela, Kenhawa, Great Sandy, Licking, Kentucky, Salt, Greene, Cumberland and Tennessee; which interlock with the rivers of the Atlantic ocean, from the Chesapeake to the Mobile Bay inclusively. The northern tributary streams are the Allegheny, Beaver, Muskingum, Hockhocking, Scioto, Little and Great Miamies and Wabash; which interlock with the waters of Chesapeake Bay to the east, and of the Lakes Ontario, Erie and Michigan to the north. These rivers, above the Scioto, have their general course parallel to the meridian: below that river, most of them run south-west and north-west. Those on the south side of the Ohio are of the greatest length, and originating in mountains, afford more water, but in consequence of falls, are not, generally, superior for navigation, to the shorter rivers of the north.

The region drained by these rivers, has about 9° of mean longitude, and 6° of mean latitude. Its extremes of longitude are from near 1° 8′ to 11° 50′; those of latitude from 34° 20′ to about 42° 15′. Its area may be estimated at 215,000 square miles (137,600,000 acres) equal to nearly one-fourth part the area of the United States, before the cession of Louisiana—more than three times greater than that of New-England—and as great, at least, as that of all the Atlantic states north of the Potomac. To the east, south-east and south, it is bounded by the Allegheny and Cumberland mountains; to the north and west, its borders are level, and but lit-

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tle higher than the centre. Throughout the whole, there is not a single lake or sandy plain, of any considerable extent.

In adverting to the political divisions of this region, we find that it comprehends a part of New-York, Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Georgia, Tennessee, Ohio, the Mississippi, Indiana and Illinois Territories, and the whole of Kentucky; four times as many states, as contribute to the formation of any river east of the Alleghenies.

The length assigned to the Ohio, by Hutchins, is 1188 miles. The circumstances under which his estimate was made, were unfavorable to accuracy; and his statement was long since believed, even by himself, to be erroneous. This has appeared clearly, since the survey by the United States, of nearly the whole northern bank of the river. From the plats of that survey, deposited in the office of the Surveyor General, as far as they extend, and from estimations of the remainder, by data, presumed to be nearly correct, the following table of distances has been compiled:

FROM PITTSBURGH			
To Big Beaver	30	Louisville	54
Little Beaver	13	Salt river	23
Steubenville	26	Anderson's river	98
Wheeling	26	Green river	52
Marietta	83	Wabash river	61
Great Kenhawa	87	Shawnoetown	10
Big Sandy	47	Cave-in-rock	20
Scioto river	40	Cumberland river	40
Maysville	50	Tennessee river	12
Little Miami	56	Fort Massac	8
Cincinnati	7	Mississippi	38
Great Miami	20		
Kentucky river	48	Total,	908

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Section II. *STATE OF OHIO.*

SITUATION AND ASPECT.

In the northern part of that extensive tract, the outline of which has been briefly sketched, lies the state of Ohio. It is bounded by Pennsylvania, Virginia, Kentucky, the Indiana and Michigan Territories, and Upper Canada. From the first, it is separated by a meridian line running to the northern boundary of the United States in Lake Erie, from the junction of Little Beaver creek with the Ohio; this river, to the mouth of Big Sandy, separates it from part of Virginia, and from Kentucky, to the mouth of the Great Miami. From that point it is bounded by a meridian line to the parallel of the latitude (not yet determined by observation) of the southern end of Lake Michigan; a line to be run on that parallel, and a portion of the national boundary in Lake Erie, divide it from the Territory of Michigan and the province of Upper Canada.

The extreme latitudes of this state may be estimated at 38° 30′ and 42° north; the longitudes are about 3° 30′ and 7° 40′ west. Its mean distance from the equator, is that of Pennsylvania, Jersey, Spain, Portugal, Turkey, and the northern parts of China and Japan. Its form is elegible, approaching nearer to the square than any other geometrical figure. Its mean breadth, from east to west, is about 190 miles; the greatest 220; its mean length, from south to north, measuring only to the shore of Lake Erie, is about 200; the greatest, which is on a meridian passing through the head of Maumee Bay, is not precisely known. Its greatest

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diagonal line, extending from north-east to south-west, is nearly 300. Its area, excluding the Lake, may be estimated in round numbers at 40,000 square miles: equal to 25,000,000 of acres.

In its aspect, this state does not afford much variety. The south-eastern portions are hilly, but not mountainous; the remainder is generally level, except in the vicinity of the Ohio and some of its larger tributary streams: many considerable tracts are so flat, as to abound in ponds and marshes. Its rivers flow either into the Ohio or Lake Erie. Those which contribute to the former, are Great Miami, Scioto and Muskingum of the first, and Little Miami, Hockhocking and Big Beaver of the second magnitude. Those of the latter, are the Maumee, Sandusky and Cayahoga of the first, and Raisin, Portage, Huron, Black, Rocky, Chaguin, Grand and Ashtabula, of the second magnitude. Its line of coast on Lake Erie is by estimation 250 miles; on the opposite side it is bounded by the Ohio river 420, making an extent of 670 miles, from which its productions may be embarked in *ships* for foreign markets.

DISCOVERY AND SETTLEMENT.

The first Europeans who explored this country were the French. By them the Gulph of St. Lawrence, the outlet of the rivers which water the northern part of Ohio, was discovered in 1534. In 1680 M. de la Salle, a Frenchman, in an inland voyage, from Quebec to the Mississippi, traversed, before any other white man, the tract between the Lakes and Ohio river. This

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adventure was imitated by many of his countrymen, who for the succeeding 70 years seem to have been the exclusive visitors of this region. During that period, no settlement was made by them within this state, and but one on the waters of the Ohio: this is Vincennes, on the eastern bank of the Wabash, which was commenced, as Volney conjectures, about the year 1735. In 1750 the British government granted to a company 600,000 acres of land, on the waters of the Ohio river. This company having attempted to make an establishment, excited the apprehensions of the French traders, and the governor of Canada opened a communication from the fort at Presqu' Isle, down the Allegheny to the Ohio river, stationing troops at intermediate distances. In 1753, they built Fort du Quesne, at the junction of the Allegheny and Monongahela rivers. In 1758 the English compelled them to evacuate it, and gave it the name of Fort Pitt, which has since been altered to Pittsburgh. In 1763, by treaty, the British power succeeded to the French, in the countries lying between the Alleghenies and Mississippi. The colonists of the former immediately commenced emigrations to the Ohio. They did not, however, descend that river a great distance; for the war of the revolution succeeding, the governor of Canada incited the Indians against the frontier settlers, and thereby suspended the extension of settlements to the west, for several years. The treaty of peace with Great Britain, left the United States still subject to Indian depredation on the north-west; and it was not until 1788, that any settlement was begun, within the present limits of the state of Ohio. In the spring of that year, a party from New-England, un-

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der the direction of Rufus Putnam, was sent out by the Ohio Company, and made an establishment at the mouth of the Muskingum river, which they called Marietta. In the following autumn, John Cleves Symmes, from the state of New-Jersey, commenced the settlement of North-Bend, above the confluence of the Great Miami with the Ohio. At the same period (where Cincinnati has been since built) fort Washington was established, and the settlement of Columbia, below the mouth of the Little Miami, undertaken. From these points, settlements were extended along the Muskingum and Miami rivers; but their progress was slow, until the treaty of Greenville, in 1795. The causes which precluded a rapid increase of population and improvement, being then removed, the advancement of both, since that time, has been unexampled—the former amounting, as we shall see hereafter, to more than 300,000: the latter extending over nearly 20,000 square miles, and rising, in many parts, to refinement and elegance.

JURISDICTION AND RIGHT OF SOIL.

From her discoveries and conquests, on the eastern coast of North America, Great Britain claimed territorial jurisdiction over the continent, from the Atlantic to the Pacific ocean. Conformably to this assumption, were the charters granted to her subjects. At the treaty of 1763, she relinquished to France her pretensions to the country west of the Mississippi; but the region east of that river, as far as the mountains, remained patented to two of the colonies. Virginia claimed that between the parallels of 36° 30′ and 41° north; and

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Connecticut that from 41° to 42°. In the treaty of 1783, Great Britain acknowledged the sovereignty of this country. By this acknowledgement, the Congress of the United States were enabled to exercise over the North-Western Territory, a jurisdiction of the same kind which they exercised over the original states; but wanted the pre-emption of the soil, and the power of establishing colonial governments. These were soon granted. In 1784 Virginia resigned to them her whole jurisdiction north of the Ohio, and her title to the soil within the present limits of the state of Ohio, except the tract between the Scioto and Little Miami rivers.* In 1786, Connecticut ceded her claim to the soil and jurisdiction of that part of her territory which lies west of a meridian line, 120 miles distant from the western boundary of Pennsylvania. In 1800 she relinquished her jurisdiction over the part which lies east of that meridian, but retained her claim to the soil. This tract is known by the name of Connecticut Reserve or New-Connecticut.

It only remained for the United States to purchase the soil and its possession from the Indians, which, in the eastern and southern parts of the Territory, was accomplished at the following periods.

By treaties in 1785—6, the Indians north-west of the Ohio, ceded the lands watered by the Muskingum, Scioto, Little and Great Miami rivers; but this treaty

* In this session, no part of the Ohio river, nor its islands, was included; and the legislature of this state has authorised the governor to appoint commissioners, to meet others from the states of Virginia and Kentucky, for the purpose of settling the question of jurisdiction.

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not restoring tranquility and good will, in 1788 another was held, in which the tract lying south and east of a line running from the mouth of the Cayahoga to the Wabash, was ceded: several tribes, however, being still dissatisfied, this cession also proved inefficient.

At the Greenville treaty of 1795, twelve tribes attended, and sold to the United States all the lands in the North-Western Territory, east and south of a line, commencing at the mouth of the Cayahoga, and running up that river to the portage between it and the Tuscarawas, one of the branches of the Muskingum; thence down that stream to the mouth of Sandy creek; thence west, to that point on Loramie's creek, where the portage to the river St. Mary commences; thence westwardly to fort Recovery, on the head waters of the Wabash; and thence south-westwardly, to a point on the Ohio, opposite the mouth of the Kentucky river. Sixteen small tracts, for forts and factories, were also sold; eight of which are in the state of Ohio. These bargains were respected.

In 1805, a session was made by seven tribes, of that part of the Connecticut Reserve, which lies west of the Cayahoga. The western boundary of this session, is a meridian line intersecting Lake Erie, through the middle of Sandusky Bay.

In 1807, a sale was made by four tribes, of a tract, chiefly in the Michigan Territory, but including that part of this state which extends north of the Maumee, and east of a meridian line passing the mouth of the Auglaize, one of its southern branches.

Five tribes, in 1808, ceded a slip of territory two miles wide, running from the western boundary of the

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Connecticut Reserve, to the rapids of the Maumee; and another, 120 feet in width, extending from the lower military reserve on the Sandusky river to the boundary of the treaty of 1795. These purchases were for the purpose of opening roads.*

By the foregoing cessions, which were made for annuities of cash, merchandise, household utensils and agricultural implements, the United States acquired an indisputable right to the soil of about two-thirds of the state of Ohio, with the exceptions of the Connecticut Reserve and the tract between the Scioto and Little Miami rivers. A part of these lands, including the mouths of the Muskingum and Hockhocking, was sold to the Ohio Company; another portion, between the Great and Little Miamies, was sold to John Cleves Symmes. The balance, after making large reservations for military purposes, specific donations, education, religion, and the future disposition of Congress, has been surveyed and offered for sale in small tracts. For these the purchasers receive the patent of the President of the United States, a title as incontestible and permanent, as the sovereignty of the nation.

In 1787, Congress commenced an exercise of their colonial jurisdiction over the North-Western Territory, by passing an ordinance for its government. According to the provisions of this ordinance, a Governor, Secretary and three Judges were to be appointed by the President, and to perform, in addition to their judicial and executive functions, the partial legislative business of adopting laws from the codes of the original

* Land laws of the United States.

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states. This first grade of colonial government, was to continue until the Territory contained 5000 free male inhabitants of full age, when the imperfect legislation of the Governor and Judges was to be superseded by that of a General Assembly, consisting of a House of Representatives elected by the people, and a Legislative Council appointed by Congress, from nominations made by the House of Representatives. By this General Assembly a Delegate was to be chosen to represent the Territory in the National Legislature.—This second grade of Territorial government, founded on a relinquishment, in part, of the prerogative of the United States, was to continue over each division into which the Territory might be separated, until its population amounted to 60,000; when the colonial prerogative of the General Government was to cease entirely, and the division be admitted into the Union on an equal footing with the other states. The officers appointed under the first of these provisions, administered the government of the whole Territory till 1799, when the second grade commenced. A separation from the Territory, of what has been since called the state of Ohio, was soon after made, and the same form of government continued in it until April, 1802, when Congress passed a law enabling the people of this division to form a constitution, which was done the same year, and in 1803 the state government went into full operation.

That part of the state not yet purchased from the Indians, which is the north-west corner, contained in 1811, the following fragments of tribes, to the names of which the estimated number of souls is annexed:

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Shawanoese -	700
Ottoways - -	550
Wyandots - -	300
Senecas - -	220
Delawares and Munsees	200

Making 1970, for the whole Indian population of the state. At the present time it is perhaps less. The Shawanoese reside on the heads of the Auglaize and Great Miami—the Ottoways principally on Lake Erie —the Wyandots on the Sandusky—the Senecas, Delawares and Munsees on the same river and its tributary streams.*

POPULATION.

The principal inducements for immigration to this state are, the fertility of its soil; the low prices of lands, and entire security of titles; the high price of labor, and the exclusion of slavery. For several years the Indian war opposed the operation of these inducements, but the Greenville treaty of 1795, brought them into full effect. Fortunately, they happened to attract most attention, in the Northern and Middle states, which are at all times able to furnish the greatest number of emigrants. In the Northern, especially, where the means of subsistence bear the smallest proportion to the population, these advantages have been fully appreciated, as appears from the prevalence of the manners and customs of New-England, over most of this state. The extraordinary emigration from that quarter cannot be wholly attributed to these inducements, but has arisen in part from a portion of the north of this state

* Letter from John Johnston, Esq. Indian Agent.

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being owned by Connecticut. In the same way the retention, by Virginia, of her right to the soil between the Little Miami and Scioto rivers, has been an additional motive with the people of that state for migrations to this. The prohibition of slavery has contributed greatly to the population of this state. The operation of this cause has not been confined to those states in which the practice of slavery is abolished, but has extended throughout the south, and is likely for many years to continue in full operation. It has even turned the current of European emigration from Kentucky and Tennessee, and spread it widely over Ohio.

The progress of increase, in this state, has been equally rapid with that of immigration. From the abundance of subsistence, the preventive checks to population do not operate, and marriages are both early and productive. Males frequently marry before twenty-one, and females before seventeen The positive checks are neither numerous nor powerful. The diseases peculiar to new countries, and incidental to those who change their climate, have an effect, not susceptible of estimation, but which is unquestionably considerable. This however, is the only cause to which much should be ascribed. From 1794 to 1812, there was no Indian war. The loss of lives, in the campaigns of 1812 and 1813 was great, but is not perceptible to observation; nor will it produce a sensible diminution in the ratio of increase. Those who perished were chiefly young men, a portion of our population that is always in excess, and which when reduced is soon restored by immigration.

It may not be uninteresting to compare the progress of population in the new transmontane states—Tennes-

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see, Kentucky and Ohio. Lying nearly in the same meridian, and almost equally remote from the parent states, their settlement may be supposed to have proceeded on similar principles, although not commenced at the same period. Within the limits of Tennessee, formerly attached to North Carolina, there were 2000 inhabitants as early as 1775. In the same year, the settlement of Kentucky, then a county of Virginia, commenced, and twelve years later, in 1787, the settlement of Ohio was begun.

The following table exhibits the population of these states, as ascertained by the three successive enumerations of the general government:

	In 1791	In 1800	In 1810
Tennessee	35,691	105,602	261,727
	In 1790		
Kentucky	73,677	220,960	406,511
Ohio (by estimation)	3,000	42,156	230,760

From tables, founded on these data, and constructed on the principle of a regular geometrical ratio of increase, it appears that the population of Tennessee increased, from 1791 to 1800, at the rate of twelve and three-fourths per cent. and doubled in six years; from 1800 to 1810, at the rate of nine and a half per cent. and doubled in eight years. Since that time, if the rate of increase has diminished regularly, it amounts to about six and three-tenths per cent. and will cause the population to double in little more than eleven years.

From tables of a similar kind for Kentucky, it appears that the population from 1790 to 1800 increased at the rate of about eleven and six-tenths per cent. and was doubled in less than seven years; from 1800 to

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1810, at the rate of six and three-tenths per cent. and doubled itself in something more than eleven years. Since 1810 it probably increases at the rate of three and one-third per cent. and will require, for the period of doubling, about twenty-three years.

In Ohio, the population was augmented at the rate of thirty and one-fourth per cent. and doubled in less than three years between 1790 and 1800 : from the latter period to 1810, it advanced at the rate of eighteen and a half per cent. and nearly doubled every four years. Since 1810, it probably increases at the rate of seven and eight-tenths per cent. and will double itself in less than ten years.

From these rates of increase, the population of the present year (1814) in round numbers must be nearly as follows : Kentucky 420,000, Tennessee 334,000, Ohio 312,000. In 1820, it will probably approach to the following : Kentucky 453,000, Tennessee 481,000, Ohio 492,000.*

These statements exhibit the greater proportional advancement of population in Ohio, than either Ken-

* As this prediction will certainly not be considered probable, it may be well to observe, that having ascertained from a comparison of the population of 1790, 1800 and 1810, the rates of increase in each state, for two periods, the rates for the third are assumed as bearing the same proportion to the second, that the second did to the first. But it must be acknowledged, that before 1820, these ratios may vary so materially as to give very different results. The maximum of population in the different states will indeed depend *mainly* on their agricultural produce, and in this respect Kentucky will doubtless have the advantage of Tennessee, though not of Ohio.

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tucky or Tennessee; and disclose to us the interesting fact, that at no very distant time, we shall outnumber either of our southern sisters. Deducting black population, we are, indeed, at this time, more numerous than Tennessee, and approach nearer to Kentucky than is generally supposed.

An enquiry into the causes of increase in the future population of these states, is neither within the power of the author, nor the plan of this work; but it may not be improper to devote a moment to the consideration of the leading causes that will secure a rapid augmentation of population in Ohio.

The cheapness of land and the high price of labor will continue to promote immigration to this state until the lands owned by the United States are principally sold and settled. The effect of these causes will then be lessened; but the general fertility of our soil, the security of land titles, and the prohibition of slavery, as already enumerated, are inducements equally strong and durable.

The extinction of the Indian title to the region watered by the Sandusky and Maumee rivers, will have a very beneficial operation on the progress of our population. The uniform richness of soil in that tract; the facility of removing to it over Lake Erie; its numerous creeks, bays and harbors on the north, and proximity to the future capital of the state on the south, must inevitably effect a rapid settlement. The formation of commercial and trading establishments on its northern border, and the construction of good roads, if not canals, between the navigable streams of the Lake and Ohio river, will also contribute greatly to a dense population in the interior.

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Lastly, the erection of manufacturing establishments will co-operate in the future augmentation of our numbers. To convert into manufacturers the hands engaged in clearing and improving a new country, would be a mistaken policy; and if adopted, must soon correct itself. In the case in which a new country is *contiguous* to an older, of dense population, which can exchange manufactures for subsistence, it may even be advisable to defer manufacturing in the former to a late period. But where a new country must transport its surplus agricultural products to a great distance, and import the necessary manufactures from shops equally remote, it may be advisable to commence manufacturing much earlier. It must not, however, attempt to convert its farmers into tradesmen. They should be imported instead of their manufactures. The ranks of agriculture would then remain entire, the simple process of barter at home be substituted for expensive and hazardous commercial operations, and the immigrant manufacturers with their increase become an addition to the population. The situation of Ohio seems to recommend this policy, and it is already adopted. Manufactures have been commenced in various places, and are principally conducted by foreigners, or persons from the Atlantic states.

It appears by the census of 1810, that the proportion of males to females in Ohio, is,

Under	10	years of age, as	100	to 94.7
Over	10	and under 16	100	93.1
	16	26	100	99
	26	45	100	85.3
	45		100	61.2
The average of which is			100	86.7

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The following is a comparative view of this mean proportion with that of some other states:

Ohio	100 males to	86.7 females
Kentucky	100	90.9
Tennessee	100	93
Rhode-Island	100	104.8
Northern States	100	100.7
Middle States	100	95
Southern States	100	97
Mexico, according to Humboldt	100	95
France, by the same	100	103

These numbers would seem to indicate, that in this state an extraordinary number of hands, in proportion to the whole population, are employed in masculine avocations, which may be the case in comparison with some of the countries named, but not with all. The black population of the Southern states, of Tennessee and Kentucky, which is chiefly employed in agriculture and the coarser mechanical occupations, is excluded from these estimates. In Tennessee, at the last census, this population amounted to 45,852, bearing to the white population the proportion of twenty-one and a quarter to one hundred, and making of the whole, about one-sixth. In Kentucky, the negroes amounted to 82,274, bearing to the whites the proportion of twenty-five and one-third to a hundred, and making of the whole mass, nearly one-fifth. While in Ohio the blacks were only nineteen hundred, being to the whites as eighty-three to one thousand, and making of the whole population less than a hundred and twentieth.

The proportion of inhabitants above forty-five years of age, to the total white population, was, by the last

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census, in Ohio, as nine to one hundred; in Kentucky, as nine and five-tenths to one hundred; in Tennessee, as eight and eight-tenths to one hundred; in Connecticut, as sixteen and six-tenths to one hundred; and in the United States, as twelve and four-tenths to one hundred. Had there been no migration to or from any section of the Union, these proportions would prove the Western States less favorable to longevity than the others. As it is, no such conclusion is deducible. The difference is produced by the continual emigration of young persons from the latter to the former, increasing the proportion of the aged in the east, and diminishing it in the west. Nothing, indeed, is more difficult, than to derive from such comparisons between an old state and a new one, any correct information on this point, as will be manifest from a reference to Connecticut and Ohio. Few persons above 60 ever emigrate to this country—let us *suppose*, then, that none exceeding that age have arrived here, since the year 1800; in this case, it is evident that all who are now 74, or older, must have been 60, or upwards, in 1800, when our population was but 42,156. At this time it is greater than that of Connecticut, but the number which have attained to 74 years is much less, for they have grown out of the 42,156, while those of the same age in Connecticut are the residue of 251,000, the population of that state in 1800. These numbers are to each other as sixteen and seven-tenths to one hundred, so that the amount of aged population in Connecticut *should* be at present nearly six times greater than that of Ohio; and if this be not the case, we are warranted in considering the former as not more propitious to old age than the latter.

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Section III. MIAMI COUNTRY.

RIVERS.

The south-west corner of the state of Ohio is watered, chiefly, by two rivers, called the Great and Little Miamies. Their general course is south-west. Their medium distance apart 20 miles.

The Great Miami is about 180 yards wide for 40 miles from its mouth; its head waters, between 40° and 41° north latitude, interlock with the Massassinaway, a branch of the Wabash, the Anglaize and St. Mary's branches of the Maumee, and the Scioto. It has generally a rapid current, but no considerable falls. It flows through a wide and fertile valley, which in spring and autumn is liable to partial inundation. Its principal tributary streams on the west, are Loramie's creek, which joins it about 180 miles from its mouth; Stillwater, which enters it about 50 miles below, and Whitewater, which it receives within 7 miles of the Ohio. The first of these is navigable for batteaux nearly 30 miles, and in this respect is superior to the others. On the east side, Madriver only, is deserving of notice. This beautiful stream originates in a pond on the Indian boundary of 1795, and glides through a tract finely diversified with prairie and woodland. It is too shallow for navigation, but at all times furnishes water enough for the largest mills. Its mouth is nearly opposite that of Stillwater, and immediately above the town of Dayton. From this place, the Great Miami is navigable, in moderate freshets, for keel and flat-bottomed boats; in high floods the same navigation may

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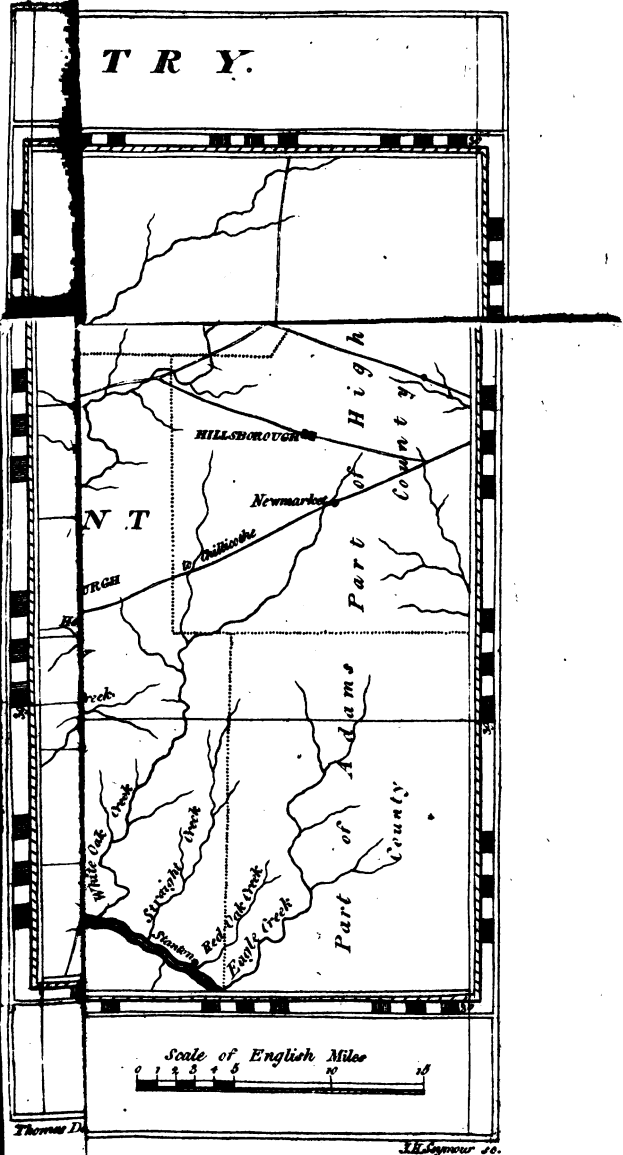

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be had from Loramie's creek; but the frequent formation of new bars, by the drifting of sand and gravel, renders the navigation, even near its mouth, difficult in low water. This river has a number of islands. The largest is two miles above the town of Hamilton. It was formed since the settlement of that place, by a portion of the river enlarging a mill-race which led into one of its branches, called Seven-mile. Near the village of Troy is a group of about twenty more, the principal of which is nearly three-quarters of a mile long. The valley of the river at this place, is a mile wide, and the banks are low and loose. The current among the islands is rapid, but the navigation is not entirely obstructed.

The Little Miami originates south of the head of Madriver, and west of the sources of Paint-creek, a branch of the Scioto. On the eastern side, it receives the East-fork, Todd's-fork, and Cesar's and Massie's-creeks; on the western side, its principal branches are Turtle, Sugar and Beaver-creeks. Like the river just described, it meanders with a shifting channel through an extensive valley; many parts of which are annually overflown. For navigation it is of little consequence, but for mills is preferable to the Great Miami. About 100 miles from its mouth, in the county of Green, it has some remarkable falls, which amount perhaps to 200 feet. The stream, at this distance, much reduced in width, enters a chasm in the silicious limestone rocks, which underlay that quarter; in the course of a mile it is precipitated from several successive tables, when, being compressed to less than ten yards, it falls from a ledge of rocks, 6 or 8 feet, into a narrower fissure, of

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such great depth, that for several rods below there is no perceptible current. The sides of this fissure, which rise by estimation 50 feet above the surface of the water, are irregular, but correspond in such a manner as to suggest that they were formerly in contact. From this point, the rapids continue more than a mile. The chasm, widening and deepening, gradually terminates in the broad valley through which the stream afterwards flows. These effects seem to have resulted from the action of the current below, and the expansion of freezing water in the fissures above, which, operating in conjunction, have covered the steep acclivities with enormous masses of rock, whose former situations are still visible. These fragments and the superincumbent cliffs are decorated with four different evergreens—the Red Cedar, Canadian Yew, Hemlock and American Arbor Vitæ, interspersed with several other uncommon trees and shrubs, which give to the scenery an aspect equally beautiful and romantic.

MILL-CREEK is the largest stream that enters the Ohio between the Miamies. Its valley is wide, fertile and more seldom overflown in the lower parts, than the vallies of the rivers just described. The mills on this stream are numerous, but the loose and unstable composition of its bed, renders the erection of permanent dams as difficult and expensive, in proportion to its width, as on the Miamies.

COUNTIES.

It has been stated that a meridian line intersecting the mouth of the Great Miami, is the western boundary of Ohio. From this line to the meridian of the eastern

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sources of the Little Miami, the distance is about fifty miles; from the Ohio river to the heads of the Great Miami, it may be estimated at one hundred, making five thousand square miles, or 3,200,000 acres, nearly an eighth part of the state. This tract formerly composed one county, named Hamilton; out of which have since been formed the eleven following:—Hamilton, Clermont, Warren, Butler, Preble, Montgomery, Green, Clinton, Champaign, Miami and Dark. A topographical description of these counties, not comporting with the plan of this work, the following brief sketches are substituted.

1. HAMILTON.

This county constitutes the south-west corner of the Miami country. In the vicinity of the Ohio, Miamies and Mill-creek, it is hilly; but the other portions are generally level. The soil of a considerable proportion is second rate; the four extensive vallies, however, which either bound or intersect it, possess great fertility. Permanent springs are not numerous, but well water is easily obtained.

In addition to CINCINNATI, the subject of the following chapters, the county contains several villages, of which the principal are *Columbia*, *Newtown*, *Reading*, *Montgomery* and *Springfield*. The first of these, in the years 1789 and '90, had the largest settlement in the Miami country, and was expected to flourish; but the bayou which is formed across it from the Little Miami almost every year, and the occasional inundation of nearly the whole site, have destroyed that expectation, and it is now inhabited chiefly by farmers.

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2. CLERMONT.

This county lies east of the last; it is large, and will probably be divided. Its southern parts are hilly, the interior and northern flat; the soil is generally second rate, and the prevailing timber oak.

WILLIAMSBURGH, the seat of justice, was laid out by Wm. Lytle in 1796, but is not populous for its age. It is healthfully situated on the north bank of the East-fork of the Little Miami, 30 miles east-north-east of Cincinnati, on the principal and shortest road to Chillicothe. It is well supplied with water for mills and domestic use. The brick clay, limestone and timber are excellent. Its only public building of note is a stone court house. It has a post office; and two printing offices, which issue newspapers entitled the "Political Censor," and "Western American."

The county has a few other villages, of which *Milford*, on the east bank of the Little Miami, 10 miles from its mouth, is the largest.

3. WARREN.

This county is sufficiently level for every species of cultivation, without being, like a part of the last, so flat as to become marshy. Its southern half has thin soil, supporting oak timber mainly; its northern, both in aspect and fertility, is equal to any land in the Miami country. Most of the streams which traverse it, have broad and productive vallies.

LEBANON, the seat of justice, lies on one of the post roads from Cincinnati to Chillicothe, between two branches of Turtle-creek, near their junction. It is 4 miles west of the Little Miami, and 30 miles north-

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north-east of Cincinnati. The site is not elegant, but is exempt from ponds, marshes and other public sources of disease. Excellent well water is obtained at the depth of 25 or 30 feet. Brick and potter's clay are abundant. Limestone of a good quality, is found within two miles of the town. Timber for building is plentiful. The town was laid out in 1803, and incorporated in 1810. Its improvement has been considerable. The houses are generally of brick and wood. Its public buildings are a court house, school house, Baptist and Methodist meeting houses, of brick, and a jail of stone. It has a post office; and a printing office which emits a weekly paper, called the "Western Star." There is an incorporated Library Company, which owns a small but valuable collection of books. An association entitled *The Lebanon Miami Banking Company*, with a capital limited to $250,000 has lately commenced business. Mechanics of different kinds are numerous, and manufactories of cotton and some other articles are about to be established.

Warren county contains three other villages worthy of notice; they are—

1. *Franklin.* This village is elegantly situated, on the east bank of the Great Miami, 10 miles from Lebanon and 34 from Cincinnati. It is a healthy spot, being without the stagnant waters which are too often found in the valley of the Miami. Beds of brick and potter's clay are common. Limestone is quarried in the bed of the river. Timber for building, of the best quality, surrounds the town; and grist and saw mills, equal to any on the river, are numerous in its vicinity. It contains about 45 families, which afford a large

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number of mechanics. It has a post office, and is the point of junction of several public roads.

2. *Waynesville.* This village is built on the west bank of the Little Miami, 10 miles north-east of Lebanon. It is inhabited and surrounded chiefly by Friends or Quakers. It has a brick meeting house, 80 by 40 feet, at which one of the two quarterly meetings of Friends in the western part of Ohio is held. It contains a post office, a brick school house, and has a number of good mechanics. Grist and saw mills are convenient. The situation is said to be healthy.

3. *Union* or *Shakertown.* This is situated on an elevated fertile ridge, four miles west of Lebanon. It is exclusively inhabited by a religious association, denominated Shakers. They occupy a number of large handsome wooden houses, and have several capacious shops, where trades and manufactures are prosecuted. Their gardens and fields are extensive, neat, productive, and cultivated in common. The whole village is, indeed, held in joint tenancy, and the products of its soil and shops are thrown into a common stock, in the use and enjoyment of which all are *said* equally to participate. By these and corresponding moral and political regulations, they have been enabled, in a manner to insulate themselves, in the midst of that society of which they were once members. This seclusion and monastic contempt of the prevalent social enjoyments, have brought upon them the obloquy of many. Without enquiring to what extent this is just, it may be briefly stated, that they are temperate, cleanly, frugal, peaceable, and honest in pecuniary dealings; that their new motives produce more industry than the old, but

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that their religious creed contains principles which mankind in general will not soon adopt, while their organization of secular affairs, on a large scale, would be wholly impracticable. They are not likely, therefore, to become either very numerous or powerful.

It was represented to the Legislature of 1810—11, that the tenets of this sect enjoin celibacy, in consequence of which several men had abandoned their families, and left them destitute of the means of support—whereupon, it was enacted that any family thus deserted, shall have decreed to them the whole, or such part of the real and personal property of the husband, as the court may consider necessary for their support; and that the children shall be entirely absolved from the authority of the father, and remain under the exclusive direction of the mother, or of guardians appointed by the court. It was also enacted, that no gifts, grants or devises of money or property, made to such a sect, in violation of the marriage covenant, should be valid, and that whoever trespassed on the law, by advising or persuading another to join a sect of that kind, should incur a fine.

4. BUTLER.

This county lies west of the one last described, and to the north of Hamilton. The Great Miami traverses it diagonally. The soil of the north-east and south-west quarters, is said to be generally poor; that of the south-east and north-west, fertile.

HAMILTON, the seat of justice, is situated 25 miles north-north-east of Cincinnati, on the east bank of the Miami. Its site is elevated, extensive and beautiful;

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but near it, to the south, there is a pond, which has contributed much to the injury of health. The materials for building are neither very plentiful nor excellent. Good timber cannot be had nearer than the neighboring hills; the limestone in the bed of the river is indifferent, but some better quarries have been opened in the uplands; the brick clay yet discovered is inferior, abounding in fragments of limestone. The dwelling houses, about 70 in number, are chiefly of wood. Well water is obtained at the depth of 25 feet.

This town was laid off about the year 1794, and incorporated in 1810. The donations for public use are, a square near the centre of the village for county purposes, and another for a church and cemetery. Its only public building is a stone jail. It has a post office, an office for the collection of the taxes on non-resident's lands in the western district of the state, and a printing office, which issues a newspaper entitled the "Miami Intelligencer."

Rossville, lying on the west side of the river, opposite to Hamilton, is a small place. *Middletown*, on the road from Hamilton to Franklin, is situated east of the river. Like most of the villages in the Miami country, it has a post office. *Oxford*, in the western part of the county, has less population and improvement, but more notoriety, than either of these, from having been fixed on as the seat of an *University*. The land is held in trust, by the Legislature, which in 1810 enacted a law directing the lots to be disposed of on leases for 99 years, renewable forever, at the rate of 6 per cent. per annum on the purchase money, to be paid annually. Being on the frontier of the state, and almost surrounded by forest

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instead of cultivated country, it has received but little attention.

5. PREBLE.

This county lies north of the last, and west of the Great Miami. It is generally rich, level, and covered with trees, among which are, the ash, yellow poplar and black walnut, of prodigious size. Its streams are, the East-fork of Whitewater, Four-mile, Seven-mile and Twin creeks, which furnish several valuable mill-seats.

Eaton, the county town, is built near the site of old Fort St. Clair, on a beautiful plain, inclined to the south. Seven-mile creek passes over it, and has a fall of 10 or 12 feet, by estimation, in the distance of 400. This fall affords a valuable situation for mills, but in summer and autumn there is a deficiency of water. The bed of this creek contains fine quarries of silicious lime-stone. The dwelling houses, about 30 in number, are chiefly of wood. There are no public buildings, except a stone jail. Good well water is obtained by digging to a moderate depth. It has a post office, and is distant from Cincinnati about 60 miles.

6. MONTGOMERY.

This county is nearly bisected by the Great Miami. On the eastern side of that river, the surface is uneven, except in the vicinity of Madriver, where there are wide and valuable prairies. On the western side, it is principally wood-land, and equal to any in the state.

Dayton, the chief town, is laid off on a fine tract of bottom land, immediately below the junction of Mad-

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river with the Miami. It was planned and surveyed under the direction of General Wilkinson, in 1796, whose title proved insufficient, and it flourished but little until 1803; when coming into the hands of Daniel C. Cooper, the present proprietor, and being made the county seat, it began to prosper. The donations of ground are, two lots for county purposes; two to the Presbyterian church; two to other congregations; and two for the benefit of schools. Its public buildings are, a court house, Methodist meeting house, and academy, of brick. The trustees of the academy, of the Presbyterian congregation, and of a library society owning about 250 volumes, are incorporated. A bank called the "*Dayton Manufacturing Company*," with a capital of $100,000 has lately been chartered, and is now in operation. Permission has been granted by the Legislature for the erection of a toll-bridge over the mouth of Madriver, but the work is not yet begun. This town contains a post office, and a printing office, which issues a newspaper entitled the "Ohio Republican."

Water for domestic use, is obtained by digging 20 or 25 feet. Quarries of valuable limestone have been discovered about two miles from the town. Good brick clay is scarce, and hence the buildings are principally of wood. For mills the mouth of Madriver affords a fine site, which is already well improved. In the vicinity of this town, otherwise so eligibly situated, there are several tracts of wet land, and a few ponds, which have rendered it somewhat unhealthy. They are said to have been of late, not so prejudicial as formerly; but until cleared, drained and cultivated, they must be regarded as nuisances. Notwithstanding this, Dayton

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contains upwards of one hundred dwelling houses, more than any town of the Miami country, except Cincinnati, and has many encouraging prospects.

7. GREEN.

This county, situated east of the one just described, is traversed from north-east to south-west by the Little Miami, and has in addition, three or four small mill-streams. In value, however, they yield to the *falls* of the Miami, at which there are two mills, and will doubtless be many others. In point of soil, the county is inferior to many in the Miami settlement. The vallies are wide and productive, but the uplands are generally second rate. The northern parts abound in tracts, nearly deprived of trees by annual burning for a long series of years, and which, in contradistinction to the rich prairies, are called *barrens*.

XENIA, the only town in the county, is the seat of justice. It has a handsome site, within two miles of the centre of the county, on the bank of a creek, called by the inhabitants, Shawanoe. It is 3 miles east of the Miami, and 55 north-north-east of Cincinnati. It was laid out by John Paul, in 1804, and incorporated in the present year. Its houses are chiefly of wood, although brick clay of a good quality is plentiful. Stone is quarried about two miles from town. There are adjoining to the town, several good springs, and well water is obtained at a moderate depth. The public buildings are, a brick court-house, academy and church. It has a post office, and a press, from which is emitted a paper entitled the "Ohio Vehicle." The situation is healthy.

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8. CLINTON.

This is a new county, lying east of the preceding, and of the Little Miami; by the branches of which, however, it is watered. In most parts the surface is rich and level, in some it is marshy, and unfit for present cultivation. It has but little prairie, and not much cleared land.

WILMINGTON, the only village in the county, is the seat of justice. It was laid out, three or four years since, and contains but few good houses. It is distant from Cincinnati 54, and from Chillicothe about 50 miles. Lying so nearly equidistant from these two towns, its relations in trade are divided between them.

9. CHAMPAIGN.

This county, comprising the north-east corner of the Miami country, is larger than any yet described, except Clermont. Its northern limit is the Indian boundary line of 1795. Madriver, and its numerous durable branches, irrigate nearly the whole, and furnish a number of sites for water works. The name of this county is characteristic of its surface—no portion of the western part of the state, having such extensive champaign tracts. These lie chiefly on the east side of Madriver, and may be divided into *barrens* and *prairies*. The former, as was just stated, are second rate wood lands thinned by fire; the latter are tracts of flat alluvion, covered with luxuriant grass and herbage. Many are swampy, and require draining, before they can be cultivated. On the west side of Madriver, the soil, aspects and timber are excellent.

URBANNA, the county seat, is one of the youngest and

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largest towns north of Cincinnati, from which it is distant 94 miles. It lies two miles east of Madriver, on an extensive, elevated and fertile prairie. Fuel and timber, at no distant time, will be scarce in the vicinity of the town, but the forest of the opposite side of Madriver will long continue to supply the latter in abundance. Clay for bricks, of tolerable excellence, is convenient. Quarries of fragile, sandy limestone, have been discovered about five miles distant, whence the town is supplied. Two permanent brooks flow over the town plot, and well water is easily obtained.

This place was laid out in 1805, by William Ward, in conjunction with the county commissioners, who reserved a square in the centre. No public buildings have yet been erected. The number of dwelling houses is about one hundred. They are chiefly of wood. There is a printing office, which issues a paper named the "Spirit of Liberty,"—a post office—and a banking company, not yet chartered by the Legislature.

The extraordinary progress of this town, in the interior of a region which 15 years ago was without any inhabitants, has been in some measure owing to the military operations of 1812—13; but independently of temporary aids, and notwithstanding annual unhealthiness, its permanent advantages must in time give it great importance.

Springfield is a village situate 14 miles south of Urbanna, in the same county. It is the older of the two, tho much smaller. The situation is not elegant, but has several topographical advantages which Urbanna does not possess. The East-fork of Madriver washes it on the north: on the south it has a copious

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and durable brook, which near its junction with the stream just mentioned, falls over a ledge of rocks to the depth of about 30 feet. This ledge affords fine quarries of silicious limestone; but the houses of the village are chiefly of wood. An extensive woolen manufactory has been erected at the falls of this creek, and the manufacture of cloths will soon be commenced.

10. MIAMI.

This county has nearly the same northern and southern boundaries with Champaign, to which it lies contiguous on the west. The Great Miami divides it from north to south. The surface is generally level, and the strata of soil and loam are deep; hence the rains can neither flow rapidly off, nor sink far into the earth, and their evaporation is retarded by a heavy and almost continuous forest. The consequence is, that like Clermont and Clinton, this county in many parts requires to be well cleared and exposed to the sun for some time, before it will produce grain to advantage.

TROY, on the west side of the Great Miami, 20 miles above Dayton, and 72 miles north of Cincinnati, is the seat of justice. It was laid out by the commissioners of the county in 1808, and incorporated in 1814. It has a public library, and a post office. The houses are chiefly of wood. No permanent county buildings have yet been erected. The reserves and donations by the commissioners are, a square for the court house; one lot for the jail; another for a cemetery; and a square for an academy.

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The site of this place is handsome, but a bayou is occasionally formed across it in high floods, and the plain declines into a swamp, at the distance of a mile from the river. This swamp lying to the south-west of the town, has rendered it unhealthy, but the expence of a drain that would convert it into dry and arable land is not estimated very high. As in other towns on the Miami, well water is easily obtained. Sandy limestone is quarried about 2 miles distant. Brick clay, of tolerable excellence, has been discovered. Good timber is plentiful.

Washington is a village of this county. It lies 8 miles above Troy, on the same side of the river, on the site of an old Indian settlement. The plain on which it stands, in less than a mile from the river, terminates in wet ground, similar to that in the rear of Troy. Timber for building is convenient, and the bed of the river, near the village, affords good limestone in abundance. The excellent millseats at this place are already improved to some extent. There is a post-office, which receives a weekly mail from Cincinnati. It was laid out by Messrs. Brandon and Manning in 1809, and has been nearly ever since in competition with Troy for the county seat of justice.

11. DARK.

This is the north-west county of the Miami tract. It is traversed by Greenville creek, Stillwater, and a few smaller streams. The eastern parts, in soil and aspect, resemble the contiguous portions of Miami. In the western half, prairies and barrens are common. In

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this county are the sites of three wooden forts, erected during the Indian war, which terminated in 1795. They are Jefferson, Greenville and Recovery. The last was built on the spot where general St. Clair fought the Indians in 1791.

Greenville only, has been occupied as a military post since the commencement of the present war. This elegant and commanding spot has been fixed on as the county seat, and is surveyed, but no buildings (except a few cabins) have yet been erected. Altho in the wilderness, it has acquired much notoriety from being the post at which the only treaties of peace with the Indians, concluded since the year 1790, have been held. After the termination of the present war, it will undoubtedly increase rapidly in population and improvement. At this time, the number of inhabitants in the county is so small, that it remains attached to Miami.

LAND TITLES.

These are all derived from the government of the United States; but in the manner of their transfer to the occupiers of the soil, there are some varieties which deserve notice.

1. VIRGINIA MILITARY RESERVATION.

It has been already stated, that in ceding to the United States her portion of the Northwestern Territory, Virginia reserved the lands between the Little Miami and Scioto rivers, for the payment of her line of troops, serving on continental establishment in the revolution-

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ary war. The following is the course pursued in locating and patenting these lands: The Secretary at War, according to a law of Congress, made to the Executive of Virginia, a return of the names of such officers and soldiers, as were, by the laws of that state, entitled to these bounties, and the Governor issued warrants to the same. When these warrants are located, a return of the surveys is made to the Secretary of State of the United States, and the patents of the President obtained. When it is found that a survey includes land previously located, the holder of the warrant is permitted to locate it elsewhere. Interfering claims, therefore, but seldom produce litigation. A large number of warrants, it is expected, remain to be located; and it is equally uncertain when they will be completed, and whether the tract reserved by the state of Virginia will be of sufficient extent: should this not prove to be the case, the General Government will undoubtedly furnish other lands.

2. SYMMES' PATENT.

In the year 1787, John Cleves Symmes, of the state of New-Jersey, made a successful application to the General Government, for the purchase of a tract of land immediately north of the Ohio, between the Miami rivers. A bargain was made with the Commissioners of the Board of Treasury for a tract, which it was expected would contain a million of acres, but which was found to embrace less than 600,000. Of this, the purchaser made payment for no more than 248,582 acres. In 1794, he received the patent of the President for

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311,682 acres, 63,100 acres being reserved in pursuance of sundry acts of Congress. These reservations were, 15 acres around Fort Washington, in the town of Cincinnati, which were sold in 1808—a complete township, to be located as near the centre of the tract as possible, for the benefit of an academy; which, however, was sold by the patentee, and replaced by the Government with a township west of the Great Miami—section 16, in each township, for the use of schools—section 29, for religious purposes—and sections 8, 11 and 26, for the future disposal of Congress; and which were, in 1808, by law directed to be sold.

For the lands contained in this patent, the deeds of the patentee are indisputable; but prior to the year 1794, he sold several tracts lying north of his patent, tho within the limits of his original purchase. These sales the Government refused to sanction, but granted pre-emptions to the purchasers, and compelled them to make payment to the Receiver of public monies at Cincinnati, and take out patents in the usual way.

8. UNITED STATES' LANDS.

The other lands of the Miami country, south of the Indian boundary, have, by the Surveyor General, acting under the direction of the Secretary of the Treasury, been divided into townships, sections and quarter sections, by lines according with the cardinal points. These have been executed with great accuracy, and constitute, with the other surveys of the Government, a more regular and beautiful system than any other country perhaps can boast. For the sale of Miami lands, excepting the 16th section in each township, reserved

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for the support of schools, a law was passed in 1800, creating the Cincinnati District, and establishing the offices of Register and Receiver. Payment for a tract being completed in the latter office, a final certificate is forwarded from the former to the Commissioner of the General Land-office, who returns the President's patent.*

PRICES OF LAND.

These have been constantly, tho not regularly, increasing, ever since the first settlement here. In 1787, John C. Symmes paid to the United States two-thirds of a dollar per acre. Their uniform price, since that time, has been two dollars, except at public auctions, when from competition, the prices are frequently raised much higher; and except reserved sections, which were at one time fixed at eight, but afterwards reduced to four dollars.

Within 3 miles of Cincinnati, at this time, the prices of good unimproved land, are between fifty and one hundred and fifty dollars per acre, varying according to the distance. From this limit to the extent of 12 miles, they decrease from thirty to ten. Near the principal villages of the Miami country, it commands from twenty to forty dollars; in remoter situations, it is from four to eight dollars—improvements in all cases advancing the price from 25 to 100 per cent. An average for the settled portions of the Miami country, still supposing the land fertile and uncultivated, may be stated at eight dollars; if cultivated, at twelve.

* See Land laws of the United States.

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Of tracts that have the same local advantages, those alluvial or bottom lands, which have been *recently* formed, command the best price. The dry and fertile prairies are esteemed of equal value. Next to these, are the uplands, supporting *hackberry*, *papaw*, *honeylocust*, *sugartree* and the different species of *hickory*, *walnut*, *ash*, *buckeye* and *elm*. Immediately below these, in the scale of value, is the land clothed in *beech* timber; while that producing *white* and *black oak* chiefly, commands the lowest price of all.

These were not the prices in 1812; the war, by promoting immigration, having advanced the nominal value of land from 25 to 50 per cent.

AGRICULTURAL PRODUCE.

GRAIN.

The principal kinds are Indian corn, wheat, rye, oats and barley. The first is found on every plantation, but flourishes best in a fertile, calcareous soil; where, with good culture, it will yield from 60 to 100 bushels per acre; but an average crop, for the whole region, cannot be higher than 45. Wheat is raised almost as generally as Indian corn, and is perhaps better adapted to the soil of most parts of the Miami country. Twenty-two bushels may be stated as the average produce per acre, tho it sometimes amounts to 40. Its medium weight is 60 lbs. the bushel. The bearded wheat, with reddish chaff, seems latterly to be preferred, as least liable to injury from the hessian fly and weavel. The cultivation of rye is much more limited, as it is only employed in the distillation of whiskey, and as pro-

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vender for horses. For the former purpose, it is mixed with Indian corn. Its average crop may be estimated at 25 bushels per acre. The common crop of oats is about 35 bushels, and that of barley 30. The latter was not extensively cultivated till since the erection of two large breweries in Cincinnati.

FRUITS.

An extensive variety of excellent *apples* have been introduced, and succeed well, in the Miami country. As in other parts of the United States, they are occasionally injured by vernal frosts. In the valley of the Ohio this is less frequently the case, than on the uplands. Cider, of a good quality, is annually made in large quantities. *Peaches* attain to great perfection, and are found on every farm. *Pears*, *cherries* and *plumbs*, of different kinds, are common: some finer varieties of the two latter, however, as well as the *apricot* and *nectarine*, have not yet been successfully cultivated. The *vine* has not been planted, for the purpose of making wine; nor has its cultivation in gardens been continued long enough to ascertain whether the soil and climate of this quarter be adapted to its growth.

FLAX AND HEMP.

The first is raised on every farm. It is said not to be so good as that of the Atlantic states. The seed, especially, is inferior, yielding much less oil than the flaxseed of those states. Hemp, a few years since, was cultivated to some extent, and found to succeed well in bottom lands, but from a depression in the price, it is now neglected.

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MEADOWS.

These are generally luxuriant. Timothy, red and white clover, and spear-grass, are principally cultivated, and yield a good crop. Two tons per acre, are considered the medium produce of the two first. They are not found, except when sown; but the latter spring up spontaneously on every farm, after the cultivation of a few years, and afford excellent pasture.

Before the settlement of this country, the woods abounded in grass and herbage proper for the subsistence of cattle, but these have long since disappeared, except in remote situations. In the prairies, however, where the whole energy of the soil is employed in producing grasses and herbaceous plants, instead of trees, the pasture is still luxuriant, and the business of grazing extremely profitable. It is chiefly of Champaign and Green counties, that this remark is true. In the former, one hundred thousand dollars, it is estimated, are annually received for fat cattle. The prairies are likewise found to support *hogs*; which grow and fatten on the numerous fleshy roots, with which those tracts abound. *Sheep*, both domestic and foreign, are already diffused extensively through the Miami country. They are in general healthy, and rather prone to excessive fatness. Their flesh is said to be superior in flavor to that of the sheep of the Atlantic states.

The agriculture of this, as of other new countries, is not of the best kind. Too much reliance is placed on the extent and fertility of their fields, by the farmers, who in general consider these, a substitute for good tillage. They frequently plant double the quantity they can properly cultivate, and thus impoverish their

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lands, and suffer them to become infested with briars and noxious weeds. The preservation of the forests of a country should be an object of attention, in every stage of its settlement; and it would be good policy, to clear and plant no more land in a new country, than can be well cultivated.

INDIANA TERRITORY.

A part of the region watered by the tributary streams of the Great Miami, is in this Territory. The portion thus situated, is bounded on the east, by the western boundary of the state of Ohio; and is separated from the interior settlements of the Territory, by a tract not yet purchased of the Indians. It is divided into three counties, Dearborn, Franklin and Wayne, which extend northwardly from the Ohio river, in the order of this enumeration. The two latter are irrigated by a beautiful stream, called Whitewater. In soil and aspect, they may be compared with Preble county, heretofore described. The soil of Dearborn is not so good, except in the vicinity of the Ohio, where, however, it is hilly.

LAWRENCEBURG is the seat of justice of this county. It is situated 22 miles from Cincinnati, in the valley of the Ohio, 2 miles below the mouth of the Great Miami. Having occasionally suffered inundation, it has grown but little; and a new village, called *Edinburgh*, has been lately laid out on higher ground, about half a mile from the river; but this is not a place of much promise.

BROOKVILLE, the county seat of Franklin, is situated

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40 miles from Cincinnati, near the junction of the two principal branches of Whitewater. It is a young, but thriving village.

Salisbury has as yet been the seat of justice in the new county of Wayne; but a village named *Centreville*, lately laid out, is at present a competitor for that distinction. Each of these county seats has a post-office.

The inhabitants of these counties receive their supplies of foreign goods almost exclusively from Cincinnati; but little mercantile capital being employed at Lawrenceburg, and there being on the Great Miami no *depot* of merchandize for that region.

KENTUCKY.

The long introduction to the Picture of Cincinnati, shall be closed with a notice of the adjoining parts of Kentucky.

Licking river originates in the mountains of the south-eastern part of this state, near the source of the Cumberland and Kentucky rivers; and after meandering about 200 miles, enters the Ohio opposite Cincinnati, where it is 80 yards wide. In spring floods, boats laden with 200 barrels of flour, can descend from points, that are more than an hundred miles distant from its junction with the Ohio; but for ten months out of twelve, its navigation is of little value; and in summer and autumn, it is a moderate mill-stream.

That part of Kentucky which lies opposite the Miami country, is hilly; the soil is various, but generally second rate; and the population scattered. There are no

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prairies or bottom lands; mill-streams are neither numerous or durable; and wells cannot be dug, on account of the limestone rocks, which, except in the valley of the Ohio, are every where found at the depth of a few feet. This tract composes two counties, *Boone* and *Campbell*. The seat of justice of the former, is 15 miles south-west of Cincinnati, and 7 miles from the Ohio. It is not likely to be a place of any consequence, as in summer and autumn, water, even for domestic use, can not be had under the distance of two miles.

Newport, the seat of justice for Campbell county, is situated immediately above the mouth of Licking. Its site is extensive, elevated and beautiful, commanding a fine view, both up and down the Ohio river. It is healthy, and affords good well water at the depth of 40 feet. The proprietor of this town is James Taylor, who laid out a few lots in 1791. In 1793, the plan was extended; in 1795, it became the seat of justice, and in 1803 the General Government fixed on it as the site of an arsenal. But notwithstanding its political advantages—proximity to the Ohio and Licking rivers—early settlement and beautiful prospects—this place has advanced tardily, and is an inconsiderable village. The houses, chiefly of wood, are, with the exception of a few, rather indifferent; but a spirit for better improvement seems to be recently manifested. Two acres were, by the proprietor, conveyed to the county, for public buildings, of which only a jail has yet been erected. The building of a handsome brick court-house has, however, been ordered. A market-house has recently been put up on the river bank, but has not yet attracted the attention of the surrounding country. Two acres

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of elevated ground were designated by the proprietor, for a *common*, but upon a petition of the inhabitants, the Legislature of the state have lately made it the site of an academy, which at the same time they endowed with 6000 acres of land. This land is not productive at present, and the academy is not in operation; but arrangements are made for the erection of a brick school-house, and the organization of a school on the plan of Joseph Lancaster. In this village there is a Baptist and a Methodist congregation, but no permanent meeting-houses. It has had a post-office for several years. The United States' arsenal is erected immediately above the confluence of Licking with the Ohio. It consists of a capacious, oblong, two story armory of brick; a fire-proof, conical magazine, for gunpowder; a stone house for the keeper, and wooden barracks sufficient for the reception of two or three regiments of men, the whole inclosed with a stockade.

Covington is a new town, beautifully situated immediately below Licking river, on the bank of the Ohio. It has just been laid out, by J. S. Gano, R. M. Gano and T. D. Carneal. It is so planned and surveyed, as to make the streets appear to be a continuation of those of Cincinnati. Each block of lots has the advantage of two 16 feet alleys .Liberal donations for public buildings have been made. The great road to the Miami country, from the interior of Kentucky, from Tennessee, Georgia and the Carolinas, passes thro this place, and will be a permanent advantage. It is in contemplation to connect this place and Newport, by a bridge across the mouth of Licking, a work that deserves an early execution.

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CHAPTER II.

PHYSICAL TOPOGRAPHY.

Sect. 1. POSITION, ASPECT & ELEVATION.

Cincinnati, the metropolis of the Miami country, is situated in a gradual bend of the Ohio river, on its northern bank. Its longitude has been determined by lieut. col. Mansfield and M. de Ferrer, who differ only one minute and a half. The average of their results is 7° 24′ 45″ west from Washington City. Its latitude, taking the mean betwixt the observations of the same astronomers, is 39° 6′ 30″ north. It lies, therefore, almost under the meridians of Lexington and Detroit, and nearly in the same parallel with St. Louis, Vincennes and Baltimore. By estimation, it is distant, over land, from Pittsburgh, 300 miles—Chillicothe 94—Detroit 275—Louisville 100—and Lexington 85.

Its site is the eastern part of a tract of alluvial or bottom land, bounded on the north by a chain of ridges, on the west by Mill-creek, on the south by the river, and on the east by Deer-creek, a brook which originates in the neighboring uplands. The area of this plain is about four square miles. It is unequally elevated, and the upper and lower tables have received from the inhabitants the names of *Hill* and *Bottom*. The latter

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(gradually widening) stretches westwardly, from the mouth of Deer-creek, where it is but 200 feet broad, to the interval lands of Mill-creek. Its medium breadth is about 800 feet. The north-west portions of this slip are the lowest. They have been overflown a few times since the settlement of the town, and in March 1793, the whole of *this* plain was inundated. The *Hill* rises about 50 feet above the *Bottom*. The ascent, which is at first steep, soon becomes gradual, and continues for the distance of nearly 1000 feet, when the surface declines gently to the base of the adjoining high lands. The medium breadth of this table is about one mile. Its western portions are uneven, and towards Mill-creek descend to the level of the *Bottom*. On the opposite side of the river, the valley has nearly the same expansion. The ranges of hills bordering these extensive plains, intersect each other in such directions as to compose an imperfect square, through the north-east and south-west angles of which the Ohio enters and passes out. Being variously divided by streams and rivulets, lying at different distances from the town, and having a dense covering of tall trees, these ridges afford a pleasant termination to the view; but the prospect along the river is limited and uninteresting. From Newport, or Covington, the appearance of the town is beautiful; and at a future period, when the streets shall be graduated from the *Hill* to the river shore, promises to become magnificent.

For estimating the elevation of Cincinnati and its vicinity above the tide water of the Atlantic states, we have no better data than the following: In the report of the Secretary of the Treasury, on the subject of roads

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and canals, it is stated that Brownsville, on the Monongahela, is 850 feet above the Atlantic ocean. If we allow in the bed of the river from that town to Cincinnati, a fall of nine inches per mile, we have in round numbers, 500 feet for the elevation of this place. The surrounding hills rise about 320 feet higher, and have therefore the altitude of 820 feet. In the report of the Commissioners of the state of New-York, the surface of lake Erie is stated at 525 feet above the tide water of the Hudson. The central tract, between the Ohio and Erie, is table land, and gives origin to several rivers, which flow in vallies that become constantly deeper as you advance towards their mouths. This will account for their rapidity of current, and cannot be considered an evidence of any extraordinary elevation in that tract. There is reason, however, to believe, that it is more elevated than the hills around Cincinnati, and consequently, that the interior of this state is between 900 and 1000 feet high.

The interior of Kentucky is probably not so elevated; as the back water of the Ohio, in great floods, ascends the rivers of that state more than 40 miles, while it does not reach farther up the rivers of this state than 10 or 15 miles. Upon the whole, the medium elevation of the country, on both sides of the Ohio, from Erie to the Cumberland mountains, in the meridian of Cincinnati, may be estimated at 850 feet above the ocean.

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Section II. GEOLOGY.

The face of the country around Cincinnati having been depicted in the introductory chapter, the reader is prepared to engage in the examination of its internal structure. If a geologist, at this place, ascend from the surface of the Ohio, when low, to the top of an adjoining hill, he observes, first, a region of tabular limestone and argillaceous slate; then a tract of alluvion, or bottom, composed chiefly of loam and clay; succeeded by a tract of the same kind, but more elevated, apparently more ancient, and consisting principally of gravel and sand; he then arrives at the same kind of calcareous strata exhibited by the bed of the river; which he sees surmounted by a stratum of loam, covered with soil, and supporting occasional masses of granite and other primitive rocks. In attempting to give some account of these strata, the following order will be pursued: I. OF THE LIMESTONE FORMATION—II. OF THE ALLUVIAL FORMATION—III. OF THE ARGILLACEOUS FORMATION, OR THE STRATUM OF LOAM AND SOIL—IV. OF THE PRIMITIVE MASSES.

I. The calcareous or limestone region under examination, is the largest perhaps in the known world. Parallel to the meridian, it extends, with few interruptions, but with considerable variations of character, from the shores of lake Erie to the southern part of the state of Tennessee, and probably to the cape of East Florida; as Mr. Ellicot informs us that the rocks of the celebrated reef, bordering that promontory, are calcareous. From the Muskingum and Great Sandy

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on the east, this formation extends westwardly beyond the state of Ohio; but to what distance, has not been ascertained. After passing the Great Miami, in this direction, the strata become disjointed, and lose their continuity, but show themselves, occasionally, even beyond the Mississippi. The lead mines, in the rear of St. Genevieve, abound in crystallized carbonate of lime; and the strata of the bed of the river, near that town, are said to resemble those of Cincinnati, except that they contain a notable proportion of chert or petrosilex.

The strata throughout this extensive region, agree in having a horizontal position, and in containing marine remains: it is therefore a floetz, or secondary formation—a vast precipitate from a lake or sea of salt water. To what depth it extends beneath the bed of the Ohio, has not been ascertained. In some parts of Kentucky, perforations in search of salt have been made more than 800 feet deep, without passing through it.

In the qualities and characters of this limestone, there is much diversity. At Cincinnati, it is of a blue or greyish blue color; has a coarse grain; receives but an indifferent polish; is of various densities, with the medium specific gravity of 2.65; affords lime of a dark color, but of sufficient strength; and is in strata from one to eighteen inches thick, which alternate with layers of clay-slate, the argilla fissilis of Turton. This substance, which is in larger quantities than the rocks it separates, has a dull blue color; breaks into thick irregular fragments; softens and is diffusible in water; effervesces with acids; contains neither sulphur nor bitumen; and has the specific gravity of 2.55. To the south it nearly disappears, and the calcareous strata

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change their character, passing into the state of marble; large quantities of which are quarried along the Kentucky river. To the east, where the argillaceous strata disappear, the limestone becomes charged with silicious earth, the species of slate called *shivers* is discovered, and in advancing a little farther, the transition to sandstone is found to be complete. This takes place before reaching Chillicothe, on the Scioto river. Limestone, however, again shows itself in spots, but with few of the characters it exhibits at Cincinnati. To the north of this town, the argillaceous slate has a great preponderance over the limestone strata; which have in that direction less solidity, and are more abundant in marine remains. This is the case for about 50 miles, when the region of silicious limestone suddenly commences. It appears at first in large quantities, but on approaching the sources of the Great Miami, it is seldom visible. The prevailing color of this stone is an ash grey; the proportion of sand or silicious earth is variable; it is frequently soft and crumbling when taken from the quarry, and hardens on exposure to the air; in some places, as at Dayton, it assumes the texture of an indifferent marble; it effervesces with acids but feebly; abounds in nodules of flint; affords white lime by burning; the lamina are generally thicker than those of the Ohio, and are frequently found consolidated into huge masses, which have small irregular cavities and perpendicular or oblique fissures. An additional distinguishing characteristic, is the existence of rapids or cascades, in all the streams which flow over it.

No vestiges of sea animals are to be found in these ancient strata, except a large bivalve shell, the name of

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which I am unable to assign. But the more recent tract of greyish blue limestone around Cincinnati, contains numerous marine exuviæ, of which the following are the most common.

1. The *anomia terebratula* and *placenta*—both composed of carbonate of lime. They are found in abundance, sometimes detached and between the strata; at other times imbeded or consolidated; never compressed, and occasionally studded inside with six sided pyramids of transparent crystallized limestone.

2. The habitations of several species of *nautilus*, usually denominated *belemnita*, *cornua ammonia*, *thunderstones*, &c. found both detached and imbeded, consisting generally of carbonate of lime.

3. *Entrochi* or *pullies*, formerly supposed to exist only in the fossil state; now said to be the remains of a species of *isis* or *coral*, named the *isis entrocha*. These are all silicious, and are commonly found detached.

4. Different species of *corallina* or *coralline*, found imbeded and detached, in large quantities—generally calcareous, now and then silicious.

5. Several species of *madrepora* and *tubipora*, found detached, and supposed by the people to be petrified wasp's nests—always silicious.

Many other species, and perhaps genera, of these curious remains, could undoubtedly be designated by a skilful naturalist.

I have never observed the bones of any land animals between, or imbeded in the strata of this formation. The head of the *sus tajassu*, or hog of Mexico, discovered by Dr. Brown in one of the nitrous caves of Ken-

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tucky, had in all probability been brought and deposited there by the former inhabitants of this country.

The metals hitherto found in this formation, are not numerous. Where it borders on the sandstone region, as towards the Scioto and in Kentucky, iron ore of an excellent quality has been discovered. Near to the Yellow Spring, in Green county, described in the last chapter, specimens of silver ore, of blend and pyrites have been dug up, but not in sufficient quantities to be worked. In the Indiana Territory, where the same formation exists, combined and intermixed with much silicious matter, blend and galena have been found.

Of saline matters, the most valuable which it affords are common salt, glaubers' salt, epsom salt, salt petre and calcareous nitre. The three first have only been found in solution. The latter exist abundantly in some of the sandstone strata and limestone caverns of Kentucky; and in some parts of this state.

II. The alluvial lands on the south side of the Ohio are narrow; but to the north of that river, where a looser stratification has permitted the streams to undermine their banks, the vallies are in general from one quarter, to a mile in breadth, and the depositions of alluvion very great. This is especially true of the Ohio, the Miamies, and their tributary and intermediate streams. The lands of this formation, generally rise in two or three successive tables from the stream to the hill, and are evidently of different ages. Most of them are lower near the hill, than at the side adjoining to the river. This is perhaps owing to the descent, in former times, of water from the uplands, which upon reaching the plain, instead of traversing it, would flow

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along the base of the hill; the surface in that direction having the same fall with the stream. Thus, in the rear of most bottom lands, there are brooks or rivulets. The older alluvions are composed chiefly of sand, gravel and water worn pebbles, covered from two to six feet deep with a bed of yellowish loam, that supports but a thin layer of soil. They are not without clay, iron, and vegetable remains; tho' in general these are less abundant than in the newer alluvions. The upper table in the town of Cincinnati, is of this kind. The gravel and pebbles are chiefly calcareous, tho' water worn fragments of chert, flint, quartz and granite are not uncommon. A large proportion of the calcareous pebbles are fragments of the variety of limestone last described. Horizontal veins of blue clay now and then present themselves near the southern edge of this plain. Veins of ferruginous pudding-stone (gravel cemented by iron) exist in a few places, and injure the well water. Vegetable substances, chiefly the decaying remnants of trees, have been found in different parts, at various depths, from 20 to 100 feet. The larger pebbles of this tract are generally nearest the surface, and on the side next the river. The beds of sand lie, in most parts, at considerable depths, and have an oblique or wave-like stratification, while that of the superincumbent pebbles is chiefly horizontal. The Bottom, or lower table is composed of loam and clay to the depth of 20 feet or more, when gravel and sand, entirely silicious, and unlike those of the Hill, present themselves and continue down to the limestone rocks. The soil of this tract, as of all the recently formed bottoms, is deep and fertile.

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The prairies of the northern part of the Miami country all belong to the alluvial formation. Many of them are low, wet, level, rich, and in the situation of new alluvions. Others appear to be very ancient, are elevated *nearly* to the highest point of the surrounding country, and would not be supposed alluvial, before a geological examination, or an inspection of the bordering wood lands. They are composed of water worn pebbles, gravel and sand, and are terminated by banks from 10 to 20 feet in height. Most of them have outlets, through which are discharged small streams of pure water.

It is somewhat singular that the alluvial lands contain so few remains of river animals, as have hitherto been found. In Cincinnati, the only vestiges of this kind, are some shells of the genus *mya*, which inhabits the Ohio. A number of these were found at the depth of 40 feet, in digging for water, near the back part of the Hill; and afterwards in the Bottom, at about the same depth, and at the distance of 200 feet from the river bank. In the former case, they were lying in connexion with grape vines, and other vegetable matter. In the latter there was found with the shells (as is asserted by creditable workmen employed in sinking the well) an arrow-head of flint, such as the Indians of this country formerly used.

The alluvial formation, it would seem, is the usual, if not the exclusive bed or depository of the huge quadruped remains, which have been denominated *mammoth bones*. There is reason to believe, that among these, there are several species, if not genera, none of which exist at the present time. But two kinds have,

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however, been unequivocally made out. One of these was certainly a species of elephant, common to Asia and North America. From naturalists it has received the name of Elephas Primigenius, or Mammonteus. The other, whose elephantine characters are doubtful, has been named by our distinguished countryman, Professor Barton, Elephas Mastodontus. M. Cuvier considers it as constituting a new genus, which he has called Mastodonton. The teeth with flat surfaces, belong to the former; those with conical and wedge shaped projections, to the latter animal. Great quantities of the bones of both, and perhaps of other nondescripts, have been found, mixed with those of the smaller existing quadrupeds of this country, in the valley of "Big-bone," a stream of Kentucky, about 40 miles by water below Cincinnati. They were deposited about 4 miles from the river, in a bed of tough blue clay, through which arise several springs of salt water.* On Lick-

* In the years 1802 and 3, Dr. William Goforth, with an ardor of curiosity that deserved a better reward than awaited his exertions, dug up at this place, and transported to Cincinnati, several waggon loads of these bones. They were, by the Doctor and George Turner, one of the members of the American Philosophical Society, examined attentively, and supposed to be the remains of no less than six nondescript quadrupeds, most of them gigantic! Among the rest, some of the bones of the rhinoceros were thought to be ascertained. Judge Turner made accurate drawings of the most curious of these fossils, but has been so unfortunate as to lose them.

In the spring of the year 1803, the Doctor formed the design of transporting these bones to the Atlantic states. They reached Pittsburgh, and were there stored. Early in 1806, Professor

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ing river, at the Blue Licks, bones of the same kind have been found, under similar circumstances. In the alluvial lands of the western parts of Ohio, but few have yet been discovered. Near the river St. Mary, one of the branches of the Maumee, a grinder of the first species was dug up.* Near Dayton, contiguous to the Great Miami, a tooth of the second species has been discovered. In the upper table on which Cincinnati is built, a joint of the back-bone of one of these species was found at the depth of 12 feet from the surface.

The only metal yet discovered, and the only one perhaps existing, in the alluvial region of this quarter, is iron † In the *bottoms* of Paint-creek, a branch of the Scioto, large quantities of bog ore can be obtained—copperas, alum and ochre abound in the same places. Near to the village of Springfield, Champaign county, ore of the same kind has been discovered in a low prairie. It is not improbable that those singular tracts will be found rich in this metal, and also in peat, both of which are desirable to a country so distant from navigable waters, and so partially covered with trees.

Barton made an application to purchase them; but at that time they had attracted the attention of a foreign swindler, named *Thomas Arville*, alias *Ashe*, who obtained permission of the owner to ship them to Europe for exhibition; since which they have not been heard of. To this personal injury of a worthy individual, the miscreant has since added a libel on the American people, and a gross insult to the British nation, by the publication of a book of travels, redundant in the most puerile and malicious falsehoods.

* This was transmitted to me by Doctor William Turner.

† Since writing the above, I have seen some experiments per-

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In this formation, the gravel and pebbles are frequently cemented into large masses, denominated breccia or pudding-stone. About 20 miles above this town, in the valley of the Ohio, are several of these alluvial rocks, of great size, and without any regular form. There are indeed a number of small hills at that place, each of which has a nucleus of this kind, and reposes on the limestone strata, along with the other alluvion of the valley. In the interior of the Miami country, masses of consolidated silicious gravel are not uncommon; and have been frequently employed by the inhabitants of that quarter for millstones, which purpose they are found to answer very well.

III. The stratum of loam, which is spread over the whole of this country, from three to twelve feet thick, is generally of a redish yellow color. It is not laminated, nor does it contain the vestiges of land, river or sea animals. It is equally destitute of ores, and has few stony combinations, except a soft argillaceous sandstone, which in some places is found disposed in horizontal strata. On the surface there is a layer of vegetable mould, of various depths.

The origin of this bed of loam is uncertain. It may perhaps be a marine deposition; but the more probable opinion, is that which ascribes it to the decay of vege-

formed by Dr. Smith, of Philadelphia, on a specimen of sand brought from the waters of the Scioto river, which proved it to contain gold. Having in my possession several specimens of a similar kind, which had been marked as disintegrated granite and gneiss, I have been induced to subject them to the action of the tests for discovering gold: the result is, that a single specimen only, contains any portion of that metal.

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tables. The volatile parts escaping in the course of a long series of years, would leave behind the earthy and metallic substances. Of the latter, iron is known to be the principal. In the soil it is but slightly oxydated, and has a dark color—in the loam, it has become more highly charged with oxygen, and assumes the redish yellow hue, mentioned above.

IV. It is familiar to all persons in any degree versed in geological science, that granite, gneiss, mica-slate, and other rocks termed *primitive*, are *naturally* inferior in situation to all the strata that have been described. In the western part of Ohio, these stones are found on the surface of the ground, or partly imbeded in the layers of soil and loam. They are sometimes solitary; at other times a great number of masses may be seen collected together and piled on each other; as in the township north-west of the village of Eaton, Preble county. They are of all irregular shapes, and of various sizes. The largest I have ever met with, is in the town just mentioned. It is composed of quartz and mica, and was estimated by Mr. Jesse Embree, who ascertained the dimensions of that part which rises above the ground, to contain at least 500 cubic feet. The strata underneath are secondary silicious limestone. These fragments of primitive rocks are said to be scattered extensively over the state of Ohio, the Indiana Territory, and Kentucky.

The mighty operation which transported into this country, these numerous masses, is entirely unknown. Mr. Kirwan has suggested that the lumps of granite which exist in limestone countries, were thrown thither by volcanoes. But the masses under consideration, are

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perhaps too numerous, some of them too large, their surfaces too free from vitrification, and their distribution too much in groupes, to favor this suggestion.—This country, moreover, contains no volcanoes, nor any obsolete craters, that have yet been discovered. Mr. Tilloch remarks, that masses of stone are sometimes transported by cakes of ice, in which they happen to be imbeded: Mr. McKenzie informs us, that the country north of the great lakes is granitic: the *secondary* strata of this region indicate it to have been once a sea; and the declivity from near the lakes to the Gulph of Mexico, favors the supposition, that at some former period there were currents over this part of the continent, from north to south. By these currents, the masses of primitive stone might perhaps have been brought down in cakes of ice, and deposited where they are now found.

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Section III. BOTANY.

A general treatise on the vegetable productions of the western part of the state of Ohio, would much exceed the limits of this work, and still more, the knowledge of its author. Nothing further, therefore, will be attempted, than a catalogue of the forest trees, and such herbaceous plants as are deemed useful in medicine and the arts. Many species will unquestionably be omitted; but enough, it is hoped, can be exhibited, to prove, that the botanical resources of this quarter are not inferior to those of any other part of the United States.

1. FOREST OF THE MIAMI COUNTRY.

FAMILIES.	SPECIES.*	POPULAR NAMES.
CEPHALANTHUS	occidentalis	*Button tree*
CORNUS	florida	*Dogwood*
———	candidissima	*Swamp dogwood*
———	alterna	*Alternate-branched do.*
———	sericea, L.	*Rose or red willow*
PTELEA	trifoliata	*Shrub trefoil*
HAMAMELIS	virginiana	*Witch-hazle*

* Not having seen that rare work, the Flora Boreali-Americana, until this catalogue was prepared for the press, most of the specific appellations are those found in the Arbustum Americanum, of Marshall. To these, no author's name is added. Those marked L. are from the Systema Naturæ, translated by Turton; the letter C. refers to Rees' Cyclopædia; and the names of the oaks are those of Michaux, as quoted in Mease's Geological View.

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FAMILIES.	SPECIES.	POPULAR NAMES.
Vitis	vulpina, L.	*Fox grape*
———	labrusca, L.	*Fall grape*
———	serotina	*Winter grape*
Hedera	quinquefolia	*Ivy*
Ceanothus	americanus	*New-Jersey tea*
Euonymus	carolinensis	*Indian arrow-wood*
———	sempervirens	*Evergreen do.*
Celastrus	scandens	*Staff tree or bittersweet*
Lonicera	virginiana	*Honeysuckle*
Ribes	oxyeanthoides	*Gooseberry*
———	floridum	*Black currant*
Ulmus	americana	*Slippery elm*
———	mollifolia	*White elm*
Sambucus	nigra	*Common elder*
———	canadensis	*Red berried elder*
Viburnum	prunifolium	*Black haw*
Staphylæa	trifoliata	*Bladdernut tree*
Rhus	radicans, L.	*Poison vine*
———	glabrum	*Sumach*
———	typhinum	*Stagshorn sumach*
———	copallinum	*Lentiscus leaved do.*
———	suaveolens L.	*Trifoliate sumach*
Æsculus	flava, L.	*Common or fœtid buck-eye*
———	maxima*	*Sweet buckeye*

BOTANICAL NOTE.

* The first specimen of this genus is figured in the Elements of Professor Barton, and is recognized by the writers named in the preceding note. Their descriptions are, however, somewhat confused, and seem to have been made from specimens of two species, considered, perhaps, as mere varieties. The names

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GENUS.	SPECIES.	POPULAR NAME.
DIRCA	palustris	*Marsh leatherwood*
VACCINIUM	staminæum	*Long leaved vaccinium*
LAURUS	sassafras	*Sassafras*
———	benzoin	*Spicewood*
CERCIS	canadensis	*Redbud*
GUILANDINA	dioecia	*Coffee tree*
HYDRANGEA	frutescens	*Mock snow ball*
PRUNUS	virginiana	*Wild cherry*
———	several varieties and perhaps species of plumb tree.	
CRATÆGUS, MESPILUS	five or six species and several varieties of haw.	
PYRUS	coronaria	*Crab apple*

Æs. octandra, Æs. flava and Pavia lutea (the latter found in the travels of the younger Michaux, who speaks of but one species in the western country) seem to belong to the common buckeye. This, and the sweet buckeye, agree in the following characters: Stamina seven: style one, absent in about four-fifths of the flowers, which have the rudiments of a germ, but are abortive and transient: Calyx swelled and five cleft: Petals four, the two superior with claws twice the length, the lateral with claws of equal length with the calyx: Capsule three celled, nuts amylaceous: Leaves in five-fingered sets.

The distinguishing specific characters of the Æs. flava, for which fœtida or lutea would certainly be a better name, are the following: Corolla generally of a light sulphur color—superior petals, with an orange colored spot—the lateral diverging; Stamina longer than the petals: Capsule prickly: Leaves equally serrulate, broad lanceolate, smooth: The whole plant with a fœtid odour: The leaves and fruit noxious to animals which

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FAMILIES.	SPECIES.	POPULAR NAMES.
Rosa	parviflora, L.	*Wild roses*
——	lucida, L.	
——	carolina, L.	
——	palustris	*Swamp rose*
Rubus	fruticosus	*Blackberry*
——	hispidus	*Running blackberry*
——	occidentalis	*Raspberry*
Spiræa	opulifolia	*Nine bark*
——	tomentosa	*Downy spiræa*
Tilia	americana	*Black linden tree*
——	pubescens	*Oblique-leaved do.*
Magnolia	acuminata	*Cucumber tree*
Annona	glabra	*Pawpaw, two varieties*
Liriodendron	tulipifera	*Poplar, yellow & white*
Bignonia	radicans	*Trumpet flower*
Robinia	pseud-acacia	*Flowering locust*

eat them. This tree grows exclusively in rich soils, and occasionally attains the diameter of 3 feet, and the height of 60 or 70.

The other species has a larger flower, with a corolla commonly red, rarely yellow or orange—the lateral petals heart subrotund, concave and closing the corolla: Stamina shorter than the petals and concealed: Capsules smooth: Leaves larger than the last, declining, lanceolate, wedged towards the base, unequally serrate, and generally villous underneath. This species delights in rich hills, and is seldom seen far from the Ohio or its larger tributary streams. It frequently arrives at the height of 100 feet, and the diameter of 4. As it is perhaps the largest species of its family, and does not appear to have attracted the attention of the botanists, I have ventured, until that shall be the case, to propose for it, the appellation of *maxima*.

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FAMILIES.	SPECIES.	POPULAR NAMES.
Ascyrum	hypericoides	*St. Peter's wort*
Morus	rubra	*Red mulberry*
Betula	nigra	*Black birch*
——— Alnus	rubra	*Common alder*
Fagus	ferruginea, L.	*Beech*
———	castanea, L.	*Chesnut*
Carpinus	betulus virginiana	*Hornbeam*
———	ostrya	*Hop hornbeam*
Juglans	nigra	*Black walnut*
———	cinerea, L.	*Butternut*
———	alba ovata	*Shell-bark hickory*
———	alba minimi	*Pig nut*
———	alba odorata	*Balsam hickory*

There are perhaps other species, of this genus, and several varieties, some of which appear to be hybrids.

Pinus Abies	americana	*Hemlock*
Platanus	occidentalis	*Sycamore*
Quercus	macrocarpa	*Bur oak*
———	alba	*White oak*
———	prinos acuminata	*Chesnut oak*
———	prinos monticola	*Mountain chesnut oak*
———	cinerea	*Upland willow oak*
———	tinctoria	*Black oak*
———	falcata	*Spanish oak*
———	coccinea	*Red oak*
Corylus	americana	*Hazle nut*
Thuya	occidentalis	*American arbor vitæ*

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FAMILIES.	SPECIES.	POPULAR NAMES.
SALIX	nigra	*Rough barked willow*
———	sericea	*Ozier*
VISCUM	album	*Misseltoe*
XANTHOXYLON	fraxinifolium	*Prickly ash*
SMILAX, four or five species of		*Green briar*
POPULUS	deltoide	*Cotton tree*
———	tremula	*Aspen*
TAXUS	canadensis	*Canadian yew tree*
JUNIPERUS	virginiana	*Red cedar*
ACER	saccharinum	*Sugar tree*
———	glaucum	*Red or water maple*
———	pennsylvanicum	*Mountain maple*
———	negundo	*Box elder*
CELTIS	occidentalis	*Hackberry*
DIOSPIROS	virginiana	*Persimmon*
GLEDITSIA	triacanthos	*Honey locust*
NYSSA	sylvatica	*Sour gum*
FRAXINUS	americana ? C.	*White ash*
———	sambuci folia? C.	*Swamp ash*
———	quadrangularis? L.	*Blue ash.*

REMARKS.

I. The foregoing catalogue comprises about sixty genera, and upwards of one hundred species of trees, which are named. If to these we add the different kinds of crataegus, mespilus, prunus, smilax and other shrubs, which are known to grow in this quarter, but have not yet been scientifically examined, we have for the forest of the Miami country, more than one hundred and twenty species. Mr. Marshall's Arbustum Americanum contains descriptions of one hundred and five genera, and two hundred and fifty species; from which

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it appears that the forest of this district produces more than half the genera, and about half the species, which were by Mr. Marshall known to exist in the United States.

II. Mr. Michaux, as quoted by Dr. Mease, asserts that in the United States there are ninety kinds of trees which grow above 40 feet in height: in the Miami country, there are about forty-five which attain to that elevation. According to the same authority, there are in the Union, thirty species which rise above 60 feet: in this quarter, there are at least an equal number which grow to that height. Hence it appears that the soil of this tract is superior to that of the United States generally, for it affords as many trees above 60 feet in height as all the states taken together, while it has only half the number of species.

III. The most valuable timber trees are the white flowering locust, white, black, low-land chesnut and bur oaks, black walnut, wild cherry, yellow poplar, blue and white ash, mulberry, honey locust, shell-bark hickory, coffee nut and beech; all of which, except the first, are common throughout the Miami country. Many other species, such as the sweet buckeye, sassafras, sugar tree, red maple, linden tree and box elder are seldom used for timber; but are of great value, in the mechanical arts. Experience has shown that the timber of the western country is softer, weaker and less durable than that of the Atlantic states; which is no doubt owing to its more rapid growth in a fertile, calcareous soil and humid atmosphere.

IV. The most elegant flowering trees and shrubs are the following, which excel in the order of their enume-

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ration: dogwood, red bud, white flowering locust, crab apple, honeysuckle, black haw, the different species of roses, plumbs and haws, the buckeyes and yellow poplar; most of which are common, and for that reason are seldom transplanted into our streets or gardens.

V. The beech, white oak, sugar tree and some kinds of walnut, hickory and ash, are the most numerous of any trees in the Miami country. The flowering locust, abundant in Kentucky and along the Ohio, is rarely found more than 30 miles north of that river. The chesnut, persimmon, fox grape and mountain-chesnut oak are still scarcer. The arbor vitæ, hemlock, yew, mountain maple, red berried elder and witch hazle I have only found at the falls of the Little Miami; while the swamp ash, cucumber tree, rose willow, leather wood and aspen, seem to be confined to the more northern portions of this tract.

VI. The juglans pacan (a species of hickory) aralia spinosa (angelica tree) and bignonia catalpa (catalpa tree) are common in the Indiana Territory as far north as the latitude of Cincinnati, but are not found east of the Great Miami. The white cedar and cypress (cupressus thyoides and disticha) are found on the river Wabash; and the white pine (pinus strobus) is said to be occasionally seen on the waters of the Muskingum; but neither is found in the Miami country. The cane (arunda gigantea) seems not to have at any time grown north of the Ohio, in this state. On the Wabash it is frequently seen, but seldom pushes itself further north than 39°. In the fertile parts of Kentucky, this vegetable, 25 years ago, formed extensive and almost impenetrable brakes, which have long since been devoured by cattle, and at present not a single stalk can be found.

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II. PLANTS USEFUL IN MEDICINE AND THE ARTS.

MATERIA MEDICA.

It has been doubted whether physicians are well employed when searching for *new* medicines; the catalogue, it is said, is already too extensive, and requires abridgement instead of augmentation. This may be correct, when applied to the Materia Medica generally; but cannot be true in relation to that of a particular country, and therefore should not deter *us* from researches into our medical botany. We may perhaps discover *new* medicines of *more* efficacy than many which are now employed; or we may at least find substitutes for a number of foreign articles. The advantages of this, would be a cheap and constant supply of such medicines, in a recent and genuine state, a lessened dependence on foreign nations, and an increased confidence in our own resources. The only agency which the following catalogue can have in the production of these national benefits, is that of exhibiting the names of the more common medicinal plants in a small district of the western country. This service, altho' humble in the extreme, cannot be wholly useless; for it may serve to call the attention of our physicians to what might otherwise be neglected, and at the same time contribute to the perfection of the general catalogue of North American medicines. It is not supposed that the articles are, in every case, referred to the proper heads; nor is this possible, in the *present* state of our Materia Medica. Of many of the simples composing it, the most which we yet know is, that they are medicinal.

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STIMULANTS.

Actea racemosa—squaw root, *the root*
Aristolochia serpentaria—virginian snake root, *the root*
Arum triphyllum—indian turnip, *the root*
Datura stramonium—jamestown weed, *the leaves*
Humulus lupulus—hop, *the flower*
Juniperus virginiana—red cedar, *the leaves and berries*
Laurus sassafras—sassafras, *the bark and oil*
——— benzoin—spicewood, *the oil of the fruit*
Leontice thalictoides—poppoos root, *the plant*
Panax quinquefolium—gensang, *the root*
Phytolacca decandra—poke, *the berries*
Rhus radicans—poison vine, *the juice*
Xanthoxylum fraxinifolium—prickly ash, *the bark and berries*

TONICS.

Chironia angularis—centaury, *the herb*
Cornus florida—dogwood, *the bark and flowers*
——— sericea—rose willow, *the bark*
Frasera verticillata*—colombo, *the root*
Hydrastis canadensis—yellow root, *the root*
Liriodendron tulipifera, yellow poplar, *the bark*
Magnolia acuminata—cucumber tree, *the bark & fruit*
Quercus falcata—spanish oak, *the bark*

BOTANICAL NOTE.

* This is the Frasera caroliniensis of Walter, and the Frasera walteri of Michaux. I am informed by Professor Barton, that he proposes to call it verticillata, which, as being the best designation, is here inserted. One of the botanical editors of Rees' Cyclopædia (Dr. Smith?) considers this the Swertia difformis of Linnæus, which is no doubt the case; but it may be questioned whether Linnæus was correct in referring it to the genus

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ASTRINGENTS.

Acer rubrum—red maple, *the bark*
Diospiros virginiana—persimmon, *the bark and unripe fruit*
Fagus ferruginea—beech, *the bark*
Geranium maculatum—crowfoot, *the root*
Orobanche virginiana—beech-drops, *the root*
Prunus virginiana—wild cherry, *the bark*
Quercus—several species of oak, *the bark*

Swertia. In the western country, the root of this plant has acquired a sort of factitious reputation, from its resemblance in appearance and taste, to the officinal colomba. In the year 1809, for the purpose of ascertaining the supposed identity of these substances, I submitted the former to some experiments; the results of which were printed in the NOTICES CONCERNING CINCINNATI; and (as that pamphlet was never *published*) are here transcribed—"This root gives out its bitterness both to aqueous and alcoholic menstrua, but more fully to the *latter*; the reverse of which is the case with the colomba. Its spiritous tincture suffers decomposition, upon the addition of water, indicating that it contains resin, which the colomba does not, at least in any considerable quantity. And the addition of a decoction or tincture of galls to its watery or spiritous infusion, causes no precipitate of cinchonin, one of the chief constituents of colomba." The inference from these experiments of course was, that the Frasera verticillata is a distinct vegetable from the eastern colomba; which conclusion has since been confirmed by the discovery of the plant that produces the latter; and which is found to belong to the class diœcia or polygamia, *(a)* instead of tetrandria, to which the Frasera is referred.

It is a bitter, without aroma, and in its recent state is said to possess considerable emetic and cathartic powers. As a medicine, it is perhaps equal to any of our native tonics.

(a) See Edinburgh Review, vol. xvi, and Barton's Cullen, vol. ii.

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EMETICS.

Æsculus flava—common buckeye, *the bark*
Asarum canadense—wild ginger, *the root*
Euphorbia ipecacuanha—wild ipecac, *the root*
Eupatorium perfoliatum—thorough wort, *the leaves & flowers*
Lobelia inflata—indian tobacco, *the leaves*
Polygala senega—seneka snake root, *the root*
Robinia pseud-acacia—white flowering locust, *the bark*
Sanguinaria canadensis—puccoon, *the root*
Spirœa trifoliata—indian physic, *the root*

CATHARTICS.

Asclepias decumbens—pleurisy root, *the root*
Cassia marylandica—senna, *the leaves*
Euphorbia colorata—bowman's root, *the root*
Iris versicolor—flag, *the root*
Juglans cinerea—butternut, *the bark*
Podophyllum peltatum—may-apple, *the root*

DIURETICS.

Collinsonia canadensis— * * * * * *the root*
Lobelia siphilitica— * * * * * *the root*
Serratula spicata—spiked saw wort, *the root, leaves & flowers*

ANTHELMINTICS.

Chenopodium anthelminticum—worm seed, *the distilled oil*
Lobelia cardinalis—cardinal flower, *the root*
Veratrum luteum—devilsbit, *the root*

DEMULCENTS.

Ulmus americana—slippery elm, *the bark*
Tilia americana—linden tree, *the bark*

PLANTS USED IN DYEING AND THE DOMESTIC ARTS.

Acer saccharinum—sugar tree, *the sap*
Æsculus flava et maxima—common and sweet buckeye, *the nuts*
Agaricus campestris—mushroom, *the plant*

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Asclepias syriaca—swallow wort, *the stalk and milky juice*
Cuscuta americana—dodder, *the plant*
Galium tinctorium— *the root*
Hydrastis canadensis—yellow root, *the root*
Impatiens biflora—wild touch-me-not, *the root*
Juglans nigra—black walnut, *the shells*
——— cinerea—butternut, *the bark*
Pyrus coronaria—crab apple, *the fruit*
Quercus tinctoria—black oak, quercitron, *the bark*
Rhus glabrum—sumach, *the twigs and berries*
Sanguinaria canadensis—puccoon, *the root*
Vaccinium macrocarpon—cranberry, *the fruit.*

III. CALENDAR OF FLORA.

As an appendix to the section on botany, the following brief essay towards a floral calendar is here introduced. It will be found to fall far short of a display of the annual progress of the vegetable kingdom in this quarter; and is only expected to impart some general information on that subject. Most of the dates are the mean terms of several years observations. These observations were made on plants growing in the valley of the Ohio, and on the declivity of the adjoining hills, where the developement of vegetation is four or five days earlier, than at the distance of even a few miles north. In the interior of the Miami country, this difference is so great, as to attract the attention of all travellers, who in spring or autumn journey in that direction from Cincinnati. Between the vallies of Mad river and the Ohio, it is supposed to equal ten or fifteen days. The causes of this remarkable backwardness in the former situation, appear to be, in part, its higher latitude, greater elevation, and damper soil. To obtain results

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that would exhibit the mean progress of vegetation in the Miami country, Lebanon, Hamilton or Franklin, would be a proper station.

FLORAL CALENDAR.

March 5 Commons becoming green
6 Buds of the water maple beginning to open
— ——— lilach ———
7 ——— weeping willow ———
8 ——— gooseberry ———
12 ——— honeysuckle ———
26 ——— peach tree ———
— Radishes, peas and tongue-grass planted in the open air

April 8 Peach tree in full flower
— Buds of the privet beginning to open
15 ——— cherry tree ———
— Red currants beginning to flower
18 Buds of the flowering locust beginning to open
— Lilach in full flower
20 Apple tree ———
24 Dogwood ———

May 9 Flowering locust in full bloom
12 Indian corn planted
— Honeysuckle beginning to flower

June 4 Cherries beginning to ripen
— Raspberries ———
6 Strawberries ———
— Red currants ———
24 Hay harvest

July 4 Rye harvest begun
10 Wheat ———
13 Blackberries ripe

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July 15 Unripe Indian corn in market
18 Indian corn *generally* in flower
21 Oat harvest
Aug. 5 Peaches in market
Sept. 20 Forest becoming variegated
Oct. 25 Indian corn gathered
30 Woods leafless.

It may not be uninteresting to add to these average dates, a few of the extremes from which they are deduced. So different in successive years, and so irregular in the same, are the approaches of spring, that in the periods at which similar phenomena occur, there is often a difference of more than a month. Thus, for example, in 1806, the weeping willow unfolded its leaves about the 20th of February, and in 1808 by the 1st of March; but in 1813, that operation was deferred to the 14th March, and in 1807 to the 6th April. Even during the *same* spring, the progress of vegetation is occasionally suspended. This was the case, to a remarkable degree, in 1810. By the 22d & 25th February, the buds of the water maple and weeping willow began to open; by the 5th of March they became stationary, and, with the other vegetables then beginning to expand their leaves & flowers, continued without advancing till near the 10th of April. On the 15th of that month, the forest around Cincinnati exhibited, when viewed from the town, not a single leaf; altho' many trees had begun to foliate and flower early in March. In the seasons at which gardens are made, and the Indian corn planted, there is an equal diversity. The latter, in the same situations, is planted in successive years, from the 25th of April to the 1st of June.

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Section iv. CLIMATE.

In attempting to obtain a correct knowledge of the climate of a country, the study of its winds is of the first consequence. To be successful in this, requires a general acquaintance with its surface and aspect. It is not sufficient to observe the topography of a narrow spot; for the course and character of a wind are often materially changed by very remote objects. Comprehensive geographical views are therefore necessary; and of this kind are the following—for the introduction of which no further apology will be offered.

North America is traversed by two ranges of high mountains—the Allegheny and Chippewan. They are found near the eastern and western sides of the continent, widely separated; but resemble each other in diverging from the meridian, in opposite directions, at the same angle—in lying about equal distances from the Atlantic and Pacific oceans—and in preserving, throughout their whole extent, a parallelism with the coasts, to which they are respectively contiguous. The western, or Chippewan range, is the highest and most extensive; originating near the arctic circle, and spreading into elevated table land in Mexico. The Alleghenies commence immediately south of the Gulph of St. Lawrence, in the 48th degree of north latitude; and are lost in the 34th or 35th degree, between the state of Georgia and the Mississippi river. In the latitude of Cincinnati, these ranges are about 25°, or 1800 miles asunder. The intermediate country is bounded on the south by the Gulph of Mexico, and on

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the north by a chain of lakes stretching to the north-west, from the 42d to the 60th degree of latitude.

From this arrangement of mountains and lakes, results a division of North America into several great regions: 1. The mountainous, consisting of two distinct and distant ranges; neither of them so high as to be covered with snow in the summer. 2. The western maritime, lying along the Pacific ocean. 3. The eastern maritime, extending from the Alleghenies to the Atlantic ocean, and naturally divisible into three sections—the northern, middle and southern. The rivers of the first, run nearly from north to south; those of the second and third, from north-west to south-east, leaving the mountains at right angles. 4. The lakes, and immense wilderness situated beyond them. 5. The valley or basin of the Mississippi, bounded on the west, east and north, by the regions just named. Being thus surrounded, the climate of this extensive tract must necessarily participate of all those which are adjacent. The mountain-districts produce some of its peculiarities; but more are perhaps attributable to the region of snow and ice and half frozen lakes, in the north.

Considered without reference to the others, the central or Mississippi district, may be characterized as a plain from 800 to 1000 feet above the ocean—depressed in the middle from north to south—cut in various directions into numerous vallies, by streams of every width—generally covered with trees in the eastern, and with herbaceous plants in the western parts—arid and rolling in the south-east; dry and level in the west; marshy to the north, and wet to the south.

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I shall now proceed to state some of the results of the observations made at Cincinnati, during the last nine years; distributing them under the following heads: I. TEMPERATURE—II. WINDS—III. WEATHER—IV. STORMS—V. COMPARISON BETWEEN THE INTERIOR AND EASTERN STATES.

I. TEMPERATURE.

The following table exhibits the *mean annual* results of eight years observations on the state of the thermometer:*

	Deg.		Deg.
1806	54.10	1810	52.77
'7	54.40	'11	56.62
'8	56.40	'12	52.65
'9	54.40	'13	52.76

The average of these results is about fifty-four degrees and a quarter; which, as it accords with the heat of our deep wells and copious perennial springs, may be regarded as an accurate expression of the *standard temperature* of Cincinnati.

The *annual range* of the thermometer will appear from the following statement:

* During this period, several different thermometers were used in succession; most of them made in London, and known to be correct, by being subjected to the proper experimental examination. They were uniformly hung in contact with wood, against the north side of a house, under shelter, and secluded from any strong reflection of the sun's rays. The results, in the table for the three first years, are from observations made by lieut. col. Jared Mansfield, when Surveyor General of the U. States. His residence was four miles north of Cincinnati. The hours for making the observations have constantly been before sunrise, and at or a little after 2 o'clock P. M. which are generally the coldest and warmest times of the day.

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	Lowest.	Highest.	Range.
1806	9°	94°	85°
'07	11 below 0	95	106
'08	4 do.	98	102
'09	2 do.	94	96
'10	7 do.	91	98
'11	8 do.	96	104
'12	5 do.	96	101
'13	10 do.	97	107

Giving 100° as a mean term.

The greatest degree of cold ever observed at this place, was on the 8th of January, 1797; when, according to governor Sargent, the mercury fell to 18° below 0. In Kentucky, nearly half a degree south of this town, Dr. Doniphan, during the same month, observed it to fall 14° below 0. At Lexington, a degree further south, in the same month, the mercury sunk 2° below 0. From nine years observations, at Cincinnati, it appears that the thermometer falls below cypher twice every winter. The greatest heat known at this place was 98°, as expressed in the preceding table. If to this be added 18, the point to which the mercury fell below 0 in 1797, we have 116° for the range of the thermometer, at this place, since its settlement. From several years observation, it appears that the mercury rises to 90° or upwards, 14 days every summer.

The *average heat* of each month, ascertained by observations from 1809 to 1813, inclusively, is expressed in the following table:

	Deg.		Deg.		Deg.
Janu.	29.88	May	61.32	Sept.	68.29
Febru.	34.42	June	71.16	Oct.	55.08
March	43.97	July	74.51	Nov.	41.75
April	57.58	Aug.	73.27	Dec.	34.54

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The *monthly extremes* and *ranges*, during the same period, are averaged and stated in the succeeding table:

		Deg.		Deg.		Deg.
January	from	—2	to	59	range	61
February	——	6	—	66	——	60
March	——	16	—	73	——	57
April	——	28	—	84	——	56
May	——	40	—	88	——	48
June	——	49	—	93	——	44
July	——	54	—	94	——	40
August	——	53	—	90	——	37
September	——	46	—	88	——	42
October	——	28	—	80	——	52
November	——	13	—	66	——	53
December	——	10	—	56	——	46

The mean of the *greatest diurnal variations* from cold to heat, and from heat to cold, in each month, throughout the same term of time, is exhibited in the following statement:

	From cold to heat.	From heat to cold.
January	29.00°	30.00°
February	31.60	27.40
March	34.40	32.80
April	29.60	32.50
May	32.75	32.50
June	27.97	26.00
July	26.60	25.00
August	27.00	25.75
September	29.75	26.25
October	30.25	30.25
November	28.75	27.25
December	24.20	24.75

The mean term of these results is 29.32 degrees for the variations from cold to heat, and 28.37 degrees for those from heat to cold. Hence it appears, that the opposite changes are nearly equal; which is contrary to popular opinion.

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The following table contains a monthly average of the difference between the temperatures of the morning and afternoon, during the five years before mentioned:

	Deg.		Deg.
January	11.36	July	17.60
February	12.45	August	17.50
March	13.89	September	18.75
April	18.57	October	15.29
May	16.74	November	12.39
June	22.08	December	9.64

The average of these numbers, 15 1-2 degrees, is the mean annual difference between the coldest and warmest portions of the day at Cincinnati.

More than thirty years ago, the Moravian missionaries,* residing on the waters of the Ohio, observed, that in advancing northwardly from that river, the climate becomes colder in a greater ratio than the increase of latitude. In confirmation of this opinion, I have received from Messrs. John Johnston, Abraham Edwards and Charles Este, a variety of facts and observations, some of which have been already stated in the floral calendar, and others will be introduced when treating of the weather.

Nothing certain is at present known, respecting the comparative heat of different places in this region, under the latitude of Cincinnati. To the west, as far as St. Louis, on the Mississippi, the heat, it is probable, remains nearly the same—beyond that town, at no very great distance, the proximity of the Chippewan mountains, to the westward, must unquestionably reduce the temperature of the plain; but to what degree remains to be ascertained.

* See Loskiel's History.

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That our climate has undergone a change, is the opinion of many people. The regular observations made here at an early period are too few and desultory to determine this point with accuracy; and many of them cannot now be had. The deficiency however, has been supplied in part, by conversation with numerous intelligent persons long resident on the Ohio, and by an abstract of meteorological observations, politely furnished by governor Sargent, formerly of this town.

The winters between 1785 and '91, are stated to have been uniformly mild. The winters of '1792-3, '95-6, '99-1800, '05-6 and '09-10 were also mild. That of 1791-2 was severe, with deep snow; the quantity which fell in January only, amounting to 24 inches. On the 23d of that month, the thermometer was 7 deg. below 0. The winter of 1796-7, is universally considered the coldest ever experienced here. On the morning of the 8th of January, as has been already stated, the thermometer was 18 deg. below 0; and in the course of the winter, it was below 0 six other mornings. The Ohio, that winter, was shut up with ice for four weeks; and frost occurred as late as the 22d of May. The winters of 1798-9, 1803-4, 1804-5, 1806-7 and 1808-9, were all severe, but not as intense as that of 1796-7. Of many of the other winters since 1790, nothing certain is known, but it is believed they were generally temperate.

Of the summers, less information can be collected than of the winters. The prevalent opinion, is, that on an average, they are neither cooler nor warmer than formerly.

Respecting spring and autumn, not much early information can be obtained. But it appears, from the ma-

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nuscript of gov. Sargent, that the latest vernal and earliest autumnal frosts in 1792, 3, 4, 5, 6, 7 and 8, occurred about the same time that they were observed to appear from 1807 to 1815.

II. WINDS.

Since the beginning of the year 1809, a register of the winds has been kept at this place. Two observations have been made daily, with so few omissions, that upwards of 4200 are on record for the first six years of that period. An exhibition of these would be improper in this work. The following table, containing the results of the whole, has therefore been constructed. The observations have all been redueed to the eight principal points of the compass; as more convenient and better calculated for general information, than a greater number.

OBSERVATIONS.

	S.E.	S.	S.W.	N.E.	N.	N.W.	E.	W.	*calm.*
January	6	2	13	8	1	21	3	6	6
February	5	1	13	8	1	14	0	5	8
March	10	1	16	11	1	10	0	5	4
April	7	0	24	10	1	8	1	3	5
May	7	1	19	10	0	10	1	4	6
June	9	1	23	12	5	7	1	2	3
July	6	1	19	11	2	11	1	4	4
August	6	1	23	10	1	12	1	1	6
September	6	1	23	9	0	8	2	3	3
October	9	1	24	6	1	10	2	4	3
November	9	3	13	6	1	10	2	7	5
December	7	1	11	5	0	15	2	6	9
	87	14	221	106	14	136	16	50	62

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From this table it appears, 1. That the different winds of Cincinnati prevail in the following order: south-west—north-west—north-east—south-east—west—east—south and north. 2. That the south-west is the prevalent wind nine months out of the twelve; viz. from March to November, inclusively. 3. That the north-west wind prevails in January, December and February. 4. That the greatest number of calm days are in December and February; the least in June, September and October, which are equal. 5. That the southern are to the northern winds, as 322 to 256; or about 40 to 32. 6. That the western are the prevalent winds throughout the whole year; being to the eastern as 407 to 209, or nearly as 4 to 2. 7. That the west wind blows only half as much in the six warmer, as in the six colder months. 8. That the east, south and north winds are nearly equal.

Most of these deductions are exhibited by the following table; in which the whole number of observations, stated above, are supposed to be represented by 1000, and the subsequent numbers to be its fractional parts.

Mean of 6 years observations = 1000, of which the

South-east make	122	
South	19	
South-west	313	
Southern		= 454
North-west	192	
North	19	
North-east	150	
Northern		= 361
East	22	
Eastern		= 294
West	70	
Western		= 575
Calm	87	

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OF PARTICULAR WINDS.

1. *The south-west.* This wind, which, as we have just seen, prevails on the Ohio three fourths of the year, exhibits two different characters, or is divisible into two varieties—the *humid* and the *arid.* The former of these is characterized by prevailing throughout the night; by generally continuing two or three days after its commencement; by alternating with the north-east wind; by sinking the barometer more than any other aerial current; and by always causing clouds, and generally rain, which is often profuse. The arid south-west commences between sun-rise and 10 o'clock in the morning. It is at first very gentle, and increases in force with the progress of the day until 4 or 5 o'clock in the evening, when it begins to subside. About sun-set it ceases, and the succeeding night is clear and serene. This is the predominant wind in the hottest and dryest weather, with which indeed it is identified in the mind of every observer in this country. Its prevalence, in comparison with the other variety, is perhaps as eight or ten to one. It is seldom attended with an atmosphere altogether cloudless, but never produces any other form of rain than a thunder shower. It sinks the barometer less than the humid south-west, but raises the thermometer higher than any other wind. It is not known whether at present it prevail more or less than upon the first settlement of the western states.*

2. *The north-west.* This wind, like that already described, exhibits two varieties, one of which occurs in warm, the other in cool weather. A state of calmness,

* For some remarks on Mr. Volney's theory of this wind, see Appendix, No. II.

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or the dry south-west, generally precedes and follows the former of these varieties. It is the gale which attends thunder storms; and of course commences to the windward. Its duration is transient, seldom continuing longer than a few hours, and its geographical extent is equally limited. The other, which is the principal variety of north-west wind, begins, it is well known, to the leeward; it generally succeeds rain, and may be regarded as the harbinger of fair weather. In spring and autumn, however, it is frequently attended with moderate showers, which seldom continue more than a day; and in winter it produces snows, that are sometimes among the deepest which fall in this country.

In common, it does not exhibit any nocturnal intermission, tho' for the most part it blows with less violence at night than in the day. It is generally followed by a calm, which is succeeded by the south-east or south-west wind. It frequently undergoes a change into the north-east, blowing from every intermediate point of the compass. On the barometer and thermometer it produces effects opposite to those of the south-west wind. The greatest elevation of the former, and depression of the latter of these instruments, hitherto observed at this place, were during the prevalence of this wind. The longer it continues, the lower is its temperature; and when that is not too much reduced, this wind feels as pleasant, as it is uniformly pure and invigorating.

3. *The north-east.* This wind, by ascending the St. Lawrence, *may* reach Cincinnati without passing over the Alleghenies; but it generally traverses those mountains, and deposits on them a part of its humidity, as

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appears from its seldom producing *much* rain or snow along the Ohio. Except, however, when it succeeds to the moist south-west, and follows a storm, this wind constantly produces one of those, or at least cloudy weather. In temperature and weight, it holds a medium between the south-west and north-west. It sometimes continues to blow for a week after a south-west storm, during which the sky will be perhaps nearly clear. It is invariably moist, and produces in all exposed to it, the sensation termed *rawness;* tho' in a much less degree than in the Atlantic states.

4. *The south-east.* This partakes much of the character of the humid south-west, for it raises the thermometer and sinks the barometer in a moderate degree. It is always damp, and generally produces rain or snow. It frequently succeeds to the north-west, and is then for the most part attended with a clear sky.

5. *The west.* This is generally a cool and rapid wind. From the region it traverses in reaching this place, it must necessarily be dry and enlivening. In the winter, when it continues long enough for the air of the Chippewan mountains to arrive, it produces intense cold, sinking the thermometer sometimes below cipher.

6. *The north, east, and south.* These winds do not prevail, respectively, more than one week in each year. The first seems to possess most of the qualities of the north-west, and the second of the north-east; the third appears to be a modification of the humid south-west, and is always stormy.

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III. WEATHER.

CLOUDS.

So various and undefinable are the degrees of turbidness, from the total obscuration of the sun, to the few scattered and fleecy clouds which are at all times to be seen, that to express the proportion of clear and cloudy weather, is extremely difficult. I have adopted the plan of noting those days as clear, in which the fore or afternoon is fair, if the other part of the day should be attended with broken clouds; and of recording those as cloudy, in which only one part of the day is altogether obscured, if the other be but overcast or hazy. Those days which throughout are in this latter state, and those which are partly clear and in part cloudy, are noted as variable. The fault of this method is, that it gives perhaps an undue proportion of clear and cloudy days to those which are changeable; but I know of no better plan, that would not be too troublesome, both to the observer and the reader.

The following table, composed from 4268 observations, expresses the results of six years:

	Clear days.	Cloudy days.	Variable days.
1809	180	107	68
'10	158	112	91
'11	187	78	85
'12	152	106	107
'13	185	111	68
'14	172	112	74
Mean terms,	172.33	104.33	82.16

From these results it may be expected, that, of the 365 days in the year, about 176 will be fair, 105 cloudy, and 84 variable.

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The condition of the weather, in each month of a mean year, for the above period, is exhibited in the following statement:

	Clear days.	Cloudy days.	Variable days.
January	9.8	13.1	7.8
February	10.3	12.0	6.5
March	13.5	9.1	8.3
April	13.1	10.3	7.6
May	15.0	8.5	7.5
June	15.5	5.0	9.6
July	19.0	5.5	6.0
August	19.6	4.6	6.5
September	19.5	5.3	6.1
October	16.1	6.0	8.1
November	9.5	13.5	5.5
December	9.6	14.1	5.8

From this table it appears, that July, August and September, have the greatest, and about an equal number of fair days; that October, June and May compose the next class; to which succeed the months of March and April, followed by February, December, January and November; that in the four latter months there is the greatest proportion of cloudy weather; that next to these rank April, March and May, succeeded by the remaining months, which are nearly equal. Lastly, that in the number of days which are variable, according to the sense in which that term is here employed, there is among the months no great difference.

RAIN.

The amount of rain and snow which falls annually at this place, has not been accurately determined, but may be stated at about thirty-six inches. Taking the mean of a series of years, it is found that in April and May there falls the largest quantity; next to these are

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November, March, December, July and October, succeeded by January, August, February, September and June. The same month, in different years, affords very different quantities of rain. September has been observed to vary in this respect, from less than an inch, to more than five; October from half an inch, to eight; and April from two to nine, which is the largest quantity ever measured at this place in a single month. The spring rains are sometimes excessive, and protracted for eight or ten weeks; during which there are showers perhaps, on an average, every third day. During the spring of 1813, there fell upwards of sixteen inches; four times the quantity which fell in the ensuing four months. At other times, this state of things is reversed. In the spring of 1814, there fell not more than nine inches; and in the three subsequent months, the quantity was equal to fourteen.

Every irregular distribution of the spring and summer rains, is of course prejudicial to agriculture. The copious and long continued storms of the former season, now and then check the early growth, or even prevent the planting, of many important vegetables. To these rains such dry summers occasionally succeed, that the pastures are consumed, the leaves of the Indian corn become curled, and those of many forest trees, in dry situations, die and fall off before the appointed time. But, fortunately, such extraordinary droughts occur too seldom, and are too limited in their extent, to be regarded as any great calamity.

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SNOW.

The quantity of snow which falls at Cincinnati, is inconsiderable. The deepest that has occurred, was perhaps ten inches, but four is about the ordinary depth; and many are not more than two or three. This being the case, and periods of mild weather occurring frequently in every winter month, the ground seldom remains covered longer than two or three days. Our snows generally follow rain, and falling on a wet surface, are in part instantly dissolved. The quantity which remains, does not, on an average, exceed eighteen inches each winter. In the northern part of the Miami country, and on the waters of lake Erie, from 40° to 42° north latitude, the snows are both deep and durable. On the 4th of January, 1813, near the Scioto river, in latitude 40° 40′ Dr. Greenlee found the snow twenty inches deep, while at this place it was only six. At Fort Wayne, about two degrees north of Cincinnati, the ground has been covered from the first of December to the first of April, while in this town, the same winter was mild and rainy. The snow at that place has even been fourteen inches deep as late as the 21st of March, when there was none here, and the thermometer rose to 40°. The absence of snow, the sudden thaws, and short periods of intense cold, which characterize our winters, have frequently been found injurious to the crops of wheat and rye.

HOAR-FROST.

This is perceived every clear and calm morning throughout the winter. In the month of January, the cold is sometimes so intense, that minute particles of

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ice are seen falling after sun-rise. In February, especially towards its close, the white frosts are considered the principal agent in promoting a flow of the valuable saccharine juice afforded by the sugar tree. So long as they return, even in the month of March, sugar water of a good quality will continue to run; but so necessary, in this case, is the agency of frost to the conversion of gum into sugar, that mild weather and southerly winds, at any time in the season, invariably diminish the quantity of water and proportion of saccharine matter, while that of mucilage is so much increased, as to prevent granulation by any means yet adopted in this country.

Mild weather in the early part of March frequently promotes vegetation to such a degree, that the subsequent frosts do great mischief. In this manner our fruit, except in the vallies of the Ohio and other large streams, where it suffers less, is injured, and sometimes entirely destroyed. The latest vernal frosts are generally at the close of the first week in May; now and then as late as the middle of that month; and on the uplands north of the town, still later by eight or ten days.*

CHEMICAL NOTE.

* It is a well established fact, that in the spring, altho' the fruit of these vallies is much forwarder than on dry and elevated situations, it suffers less from frost. This seems to be owing chiefly to the fogs, which probably operate in the following manner: When vapor is condensed into water, it gives out a large portion of heat; if it undergo consolidation into ice, as in the production of frost, it discharges an additional quantity of caloric: Now, when the lower portions of a fog are cooled to the freezing point, and pass into ice, the heat which is liberated ascends and keeps up the temperature of the superincumbent vapor. In this manner, its congelation advances by very

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The earliest autumnal frost observed in the vicinity of this place, was on the 9th of August 1809. On the last day of that month in 1789, the Indian corn in the northern part of Kentucky was killed by frost. In general, the last of September is the earliest period at which white frost is perceptible in the valley of the Ohio. In the upland country it is seen several days earlier. Towards the heads of the Great Miami, these September frosts are so severe as sometimes to injure the Indian corn which was planted late in the spring.

It is an intense winter at Cincinnati, which, in exposures to the sun, keeps the ground frozen a month. The frost sometimes penetrates to the depth of eight or ten inches; but for the most part, there is no congelation below five or six.

HUMIDITY.

The fogs of the Ohio and its tributary streams are most common from May to October, inclusively. They are generally succeeded by fair and hot days, and are seldom seen in cloudy or windy mornings. They are too dense to admit the view from one side of the Ohio to the other; but generally suffer dissipation before

slow degrees. In a dry situation, there is not much vapor to condense, but little heat is of course set at liberty, and the cold increases to such an extent as to freeze the young and succulent fruit. Were the fogs and dews of these vallies exhaled during the day, entirely from the fields over which they settle, as in the upland country, their nocturnal condensation would impart no more heat than what they had carried off when evaporating; but as they arise from the surface of the river, their decomposition over the land, must be regarded as a real transportation of heat from the former to the latter.

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eight o'clock. In winter they are occasionally seen and admired under the name of *visible vapor*. When of this kind, they arise to a great height, in dense and circumscribed columns. The thermometer is on these occasions for the most part at or below cipher; or at least the air is much colder than the water.

The dew, in the woody vallies of this country, is so copious in the summer and early autumn, as to be felt before sun-set. In the course of the night it sprinkles from the leaves like drops of rain; but in more elevated and open situations, its quantity is much less.

Mr. Ellicot* has pronounced the country between the Ohio and lake Erie, to be moister than the Atlantic states. His observations, however, were made in the depths of the forest, and cannot therefore be compared with those made in a settled country. It is said that iron and brass become tarnished in a shorter time at Cincinnati than in Pennsylvania; but the difference, I apprehend, is not very great. There is no difficulty at this place in keeping surgeons' instruments from rusting; linen well dried, and kept in drawers, may afterwards be used with as little airing as in the eastern states; and musquetoes along the Ohio are uncommon. The summer of 1814 formed an exception to this statement. During that rainy season, most of the books in the libraries of the town, and dried specimens of plants kept in a close herbarium, for the first time became more or less mouldy, and musquetoes were numerous for many weeks. Upon the whole, the diminution of moisture which follows the clearing and cultivation of our wood lands, is

* Philosophical Transactions, vol. iv.

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such, as to support the conclusion, that when the country shall be extensively opened, its atmosphere will become as dry as any part of the Union.

INDIAN SUMMER.

In the autumn of every year, we have a period to which this appellation is affixed. It generally succeeds to rain or snow and severe frost; beginning in October or November, and continuing for two or three weeks, with an occasional storm. But the atmosphere is, for the most part, dry, serene and smoky, through which the sun and moon exhibit in the morning and evening a face of darkened crimson. The verdure of the forest fades away, or passes into the countless varieties of brown, red and yellow, which give to the surrounding scenery a dull and sombre aspect. The occurrence of rain, with a north-west wind, at length suddenly dispels the gloom, strips the wood of its remaining foliage, and introduces winter, with a transparent and cheering atmosphere.

The effect of this peculiar atmosphere on hypochondriacs, tho' less in degree, is similar to that produced by the November fogs of Great Britain.

The cause of this smokiness is supposed to be the conflagration, by the Indians, of withered grass and herbs on the extensive prairies to the north-west, and hence perhaps the name of the season.

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IV. STORMS.

This country has never been visited by a violent storm either from the north-east or south-east; nor do the clouds from any eastern point between north and south, often exhibit many electrical phenomena. But from every direction on the opposite side of the meridian, they come charged with lightning & driven by impetuous winds. Of these thunder-gusts, the north-west is by far the most prolific source. They occur at any time during the day and night, but most frequently in the afternoon. The arid south-west having blown in fitful breezes through the forenoon (the thermometer rising rapidly, and the barometer falling) not long after mid-day a dark cloud is observed in the north-west. As it advances, it is preceded by light winds, and illuminated with frequent flashes of lightning; while in the zenith, and to the south-east, the condensation of vapor into clouds may be seen going on with great activity, and in a short time the whole sky is obscured with a dark canopy. The wind now and then increases until it acquires such momentum, as to unroof or demolish the frailer kind of houses, prostrate whole fields of corn, and open vistas through the stoutest woods. A profuse fall of rain, with tremendous thunder and lightning, generally follows. Trees and houses are sometimes struck, but no very serious injury has been sustained in this place—not one house has been destroyed, nor a single person killed. To the raging of the storm succeeds a refreshing coolness and elasticity of the air; the volumes of dust which thickened it are found to be dispersed; the pale and drooping leaves display a deeper verdure; and the animal powers, rendered lan-

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guid from the preceding heat and rarefaction, are completely renovated.

The south-west occasionally sends forth hurricanes still more destructive. The most extensive and formidable which we have suffered, was on Sunday the 28th of May, 1809. For two or three days previous to that time, the wind was various, with a turbid atmosphere. On the morning of the 28th it veered to the south, and blew with violence. During the forenoon, while the lower clouds were passing rapidly to the north, the upper were moving with equal velocity to the east; indicating a superior current, which traversed the course of the south wind at right angles. Before twelve o'clock both strata of clouds were propelled eastwardly, and soon after the west wind was perceptible at the earth's surface. By three-quarters past one o'clock, the sky was very much obscured, and a narrow whirlwind or tornado of great force, swept impetuously across the eastern part of the town. It demolished a few old buildings, threw down the tops of several chimnies, and overturned many fruit and shade trees. The people in the centre of the town had scarcely time to view this alarming operation, before their own houses were shaken to the foundations by another gale of equal violence; this was immediately succeeded by a third, which traversed the western part of the town with augmented fury. By this last, a handsome brick edifice, designed for tuition, was blown down, in consequence of having a cupola disproportionate to its area; and various minor injuries of property were sustained—but the inhabitants escaped unhurt. A copious shower of rain and hail, with thunder and lightning, increased the terrific gran-

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dour of the scene. Each of these tornadoes ascended the hill to the north-east of the town, forming a track through the forest, which remained visible for more than a year. Several veins of a similar kind passed over the adjoining country, both south and north, to the distance of a hundred miles. The same hurricane, as appears from the public journals, ascended the Alleghenies during the afternoon, and made its exit from the continent about 8 or 9 o'clock in the evening. To the south-west of this place, as far as the state of Tennessee, it seems to have occurred nearly at the same hour that it commenced here. Beyond that state, I have not been able to trace it. Mr. Henry Bechtle, who was on the Mississippi in latitude 33°, felt nothing of it on the 28th, but experienced on the preceding day a brisk southern gale; and I am informed by gov. Sargent, that in the vicinity of Natchez, the 28th was fair, with moderate southerly breezes, which was the case for many days before, and several days after that, on which the storm occurred.

From the history of this hurricane, altho' very imperfect, it appears—

1. That it commenced to the windward.
2. That it travelled about 80 miles an hour.
3. That it was not derived from the Gulph of Mexico.
4. That it was formed, about the same time, in the western parts of Ohio, Kentucky and Tennessee, by the collision of two winds, the south and west; which when combined, of necessity moved towards some point between north and east, with increased velocity and power. This, however, must be regarded as a deduction, and not, like the three first, as a well ascertained fact.

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On the afternoon of the 4th of May, 1814, we experienced, from the same quarter with the hurricane just described, another of less violence, which was attended with some peculiarities worthy of record. The weather had been changeable throughout the earlier part of the day, and in the afternoon there was a fall of hail, with but little thunder or rain. The hail-stones at this place, tho' misshapen, were of the ordinary size; but in the western part of the county, some of them were of surprising magnitude, and of many angular forms. Several weighed from 8 to 10 ounces each, and measured between 15 and 16 inches in circumference. It was perfectly calm when they fell, or much mischief would unquestionably have been done. The hail storm was followed by a moderate shower of rain, and a powerful blast from the south-west, in which many persons at Cincinnati felt currents or veins of air, heated to a very unusual degree. On the next day the foliage of various plants was found to be destroyed. It was chiefly the leaves which grew to the windward, and were consequently most exposed, that suffered. They were neither lacerated nor wilted, but sustained an injury, which upon exposure to the sun the ensuing day, caused them to wither. In some cases, only the tip of the leaf perished; in others, the whole was destroyed. Whether this extraordinary effect should be ascribed to heat, or to a noxious quality of the wind, is uncertain. I could not perceive that one species of plant was more affected than another; and of individuals growing near the same spot, it was common to find only a part affected.

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V. COMPARISON BETWEEN THE INTERIOR AND ATLANTIC STATES.

Ever since the publication of the celebrated "Notes on Virginia," in 1787, the Ohio-countries have been considered warmer, in the same parallels, than the Atlantic states. The difference was supposed, by Mr. Jefferson, to equal what would result from three degrees of latitude. Imlay, in his letters on Kentucky, written four years after, has advanced a similar opinion. The ingenious Mr. Volney, availing himself of the facts collected by the former of these authors, has extended their remarks, and assigned to the hot region its northern and southern limits; which he informs us are the 36th and 42d degrees of latitude. Professor Mitchill, in his learned and thorough review of Mr. Volney's book, by not opposing, has admitted this assertion, and Dr. Mease, in transcribing large portions of the speculations on this subject, into his "Geological View," has given them his sanction. Finally, Doctor Morse, and most other compilers of American Geography, have adopted this opinion, and its diffusion among the people of the United States has for many years been general. Thus fortified with eminent names, and guarded by popular prejudice, it may seem a rash undertaking to attack this position; but as not many of these gentlemen ever visited the western country, and as most of them were, it is evident, in possession of but few accurate observations on the climate of this region, it may perhaps be excusable to doubt the correctness of their conclusions.

That there is a difference of temperature in the climates of these regions, is perhaps undeniable; but it

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seems to consist more in the distribution, than in the absolute quantity of heat.—Or at least, if there be a difference in this respect, it can not equal one-third of what has been mentioned. That the Miami country, in its climate, resembles the centre of North Carolina; and that Richmond, for four months, is invested with the ice and snows of Fort Wayne, is what those who may happen to winter successively in these various and distant places, will, I apprehend, scarcely admit. But the most conclusive facts in opposition to this opinion, are furnished by the thermometer. The average result of eight years observations at this place, it will be recollected, is 54.25 degrees. Dr. Rush states the annual heat of Philadelphia at 52.5 degrees; more recently, Dr. Coxe, from six years observations, deduced 54.16 degrees. From manuscript information, with which I have been liberally furnished by Mr. Legaux, it appears that the mean heat of Springmill, on the Schuylkill, nearly a degree north of this place, as drawn from seventeen years observations, is 53.32 degrees. The mean term of these, 53.66 degrees, considered as the standard temperature of that quarter, is only six-tenths of a degree lower than that of Cincinnati, which is 50 minutes further south. Again, Mr. Legaux found the mean heat of 1810 and 1812, at Springmill, to be 54.50 and 54.30 degrees; that of the same years at Cincinnati was 52.77 and 52.65 degrees, giving in both cases about one degree and two-thirds less heat to the latter than the former. Again, Mr. Jefferson states the heat of a cave in Virginia, near the latitude of Cincinnati, at 57 degrees, about two degrees more than the heat of the earth at this place.

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A reference to the temperatures of summer and winter will give nearly the same results. From nine years observations (three at Springmill by Mr. Legaux and six in Philadelphia by Dr. Coxe) the mean summer heat of Pennsylvania appears to be 74.6 degrees. The mean summer heat at this place, for an equal number of years, is 74.1 degrees. The average number of days on which the thermometer ascended to 90 degrees or upwards, during the same period, was fourteen each summer; and the greatest elevation observed, was 98 degrees. All of which would bear a comparison with corresponding elevations in Pennsylvania. Mr. Legaux* declares the most intense cold at Springmill, from 1787 to 1806, to be 17.5 degrees below 0; within that period, at this place, the mercury fell, as we have already seen, 18 degrees below 0. The average of extreme cold, in several years, is stated by the diligent observer just named, at 1.8 degrees below cipher; the same average at this place, from five years observations, is 2 degrees below. Mr. Volney asserts that he has seen the mercury, for several successive days, at 6 and 8 degrees below cipher. Near the Ohio, in December 1796, the mercury was observed for three mornings in succession, to be 14, 12 and 1 degree below 0, and for the ensuing three, to fall between 8 and 1 degree above. Again, we are told by Dr. Rush, that in Pennsylvania, the parallel of 41 degrees is the southern limit of steady cold; in the state of Ohio, numerous observations go to prove that the cold is intense and regular, even before advancing to that latitude. And Mr. Volney informs

* See M'Mahon's Calendar.

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us, that the Potomac seems to constitute a southern limit to the snows of Pennsylvania and Maryland, as sleighs are almost useless and unknown beyond that river; in this country, of the Ohio river, in the same latitudes, a similar remark may be made. Lastly, the French traveller informs us, that in the times of harvest at Monticello and at Kaskaskias, near the river Mississippi, places having the same elevation and latitude, there is a perfect coincidence; and I have found, by comparing the seasons for harvesting hay, rye, wheat and oats, on the Schuylkill, as stated by Mr. Legaux, with the same at this place, that there is no difference.

But much reliance is placed on the growth and residence, in this country, of certain plants and animals, which in the maritime states are, it is said, not found as far north by several degrees. Of the former, Mr. Jefferson has cited the reed and catalpa; of the latter, the parakeet. We will consider these separately. 1. This bird, it is true, resides constantly along the Mississippi, Ohio, and their tributary rivers, as far north as 39° 30′, and is seen occasionally up to 42°. But it is a well ascertained fact, that the climate of these latitudes is much colder than that of places in the Atlantic states, where this bird is rarely seen. There must be causes, therefore, for its higher latitude in this country, that are not connected with climate. One of these, Professor Barton suggests, is the southern course of our great rivers. If this bird, as most of its family still are, was originally an inhabitant of the tropics, it must have migrated into the depths of this region, along the Mississippi and Ohio. The wide alluvial vallies of these rivers, it is observed by the late ingenious and

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lamented Alexander Wilson, abound in the favorite food of this bird; such as the fruit of the cockle bur (*xanthium strumarium, L.*) cypress, hackberry, beech and sycamore, most of which are rare or unproductive in Pennsylvania. To these, the same distinguished Ornithologist remarks, may be added the salines or salt licks of this country, about which he never failed to see flocks of parakeets. Finding a region abundantly stored with agreeable food, this bird long since became its permanent inhabitant; and acquired hardiness of constitution sufficient to enjoy good health, where the average heat of some months in winter is seven degrees below the freezing point. In the Atlantic states, the rivers flow to the east or south-east. In advancing towards Pennsylvania, therefore, this bird cannot travel *along*, but must *cross* their vallies; a movement which it has no inducement to make, and hence it generally stops among the cypress swamps of North Carolina and southern Virginia. 2. The catalpa. It would seem that soil, or some other circumstance, more than climate, regulates the geography of this tree; for it is found on the Wabash, in the latitude of the Miami country, and grows perfectly well at this place, but was never seen here until planted. It flourishes in Pennsylvania, and even preserves itself in the climate of Great Britain, if placed in sheltered situations. Its native growth in the western country cannot therefore be considered an evidence of superior mildness of climate. 3. The reed or cane, which, I believe, has not been found east of the Big Sandy, was probably brought to this latitude by that river, together with Licking and the Kentucky. Finding a saline,

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fertile soil, it became naturalized, as it no doubt would in the dry alluvial lands of the Potomac. There is certainly nothing in the coldness of the climate along that river to prevent it; for in the winter of 1796-7, in a part of Kentucky where the cane once grew luxuriantly, and where it still existed, the thermometer between the 22d December and the 10th January, sunk many times below cipher, and once to 14 1-2 degrees beneath that point, without destroying that vegetable.

To these examples Mr. Volney has added several others, as the cotton, tobacco and Indian corn; sassafras, pawpaw and pican. The last of these trees is peculiar to the western country, and cannot therefore be used in the comparison: the pawpaw grows in the fertile parts of Virginia, as far north as this town, and the sassafras is found even on the banks of lake Champlain: the Indian corn is cultivated with success in New-England, and tobacco has long been one of the staples of those parts of Virginia and Maryland which are under the same parallels with the Miami country; cotton is not considered worthy of cultivation in the state of Kentucky north of Green river, in lat. 37° 30', altho' it will occasionally ripen at Cincinnati, as it has been known to do near Philadelphia. Such are the facts adduced to substantiate this opinion. Most of them, I think, prove nothing; and if a few be admitted to give some feeble support, they are sufficiently counteracted by the thermometrical and other observations which have been stated.

Other phenomena might be cited in support of Mr. Jefferson's conclusion, but when critically examined they fail to have that effect. 1. The Delaware at

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Philadelphia is oftener frozen over than the Ohio at Cincinnati; but this seems to arise from that city being 50 minutes further north than this town; and from the former of these rivers being much cooled by deep snows after flowing directly south, out of a mountainous tract between latitudes 42 and 43 degrees; while the Ohio for 400 miles meanders in a deep, narrow and reverberating valley, has generally a western direction, at one point extends as far south as 38° 30′, and receives the Kenhawa and Big Sandy rivers, which originate between 36 and 37°.* Every five years, on an average, is perhaps as often as the Ohio is blocked up with ice at this town. Concerning the Potomac, in this respect, I have been able from the accounts of that river to collect nothing. 2. Another fact, is the existence of the soft-shelled turtle in the waters of the Ohio, while in the Atlantic states it is not found north of Georgia. It is even said that this reptile inhabits lake Erie, which is not improbable, as it could pass thither in those floods which occasionally connect the tributary waters of the lake and Ohio. But waving this, it is certain that this turtle is found in waters much colder than any of South, or even of North Carolina; so that its higher latitude on this side of the mountains cannot be considered as indicating inordinate heat.

* How much the freezing of rivers in the middle latitudes is affected by their *courses*, appears further, from the fact communicated to me by Mr. Wm. Rector, that in the winter of 1808-9 the Mississippi, at St. Genevieve, in latitude about 38 degrees, was so firmly covered with ice in a single night, as to bear horses and carriages the ensuing day. The river above that town runs directly from north to south.

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Mr. Volney considers the superior prevalence of the south-west wind in this country, a conclusive proof of greater mildness in its climate; and this, it must be confessed, seems at first view a strong fact. Did it blow ten months out of twelve, and travel directly from the Gulph of Mexico, as Mr. Volney supposes, it must of necessity raise the temperature of this country much higher than that of the Atlantic states. But it prevails only nine months of the year; has generally no great velocity; in most cases, blows not more than eight hours of the twenty-four; and there is reason to believe that but little of it comes from the Gulph of Mexico. It probably consists of air from beyond the Mississippi, which is obeying a general law of the atmosphere in the temperate zone by moving eastwardly, and from which course it is deflected by the vallies of the great rivers that traverse this region. Considered under this point of view, we can comprehend how the south-west may be the prevailing wind in the interior, and the west-north-west in the maritime states, without any great difference in temperature; and this is rendered still more palpable, by reflecting, that the rivers of the Atlantic states generally run from the north-west, and of course, when this wind reaches the summit of the Alleghenies, it may assume the direction of the vallies beyond, and be restored to its original state of a west, or even become a north-west wind. Another argument of a similar kind, in favor of a difference of temperature, between the interior and maritime districts, is the greater prevalence of the north-west wind in the latter. Even this, however, may in part be explained away. The north-west wind of the Miami country and Ken-

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tucky, in its passage thither, traverses but few lakes. It comes from the northern, and perhaps most elevated portion of the Chippewan mountains, and is thereby rendered intensely cold: the same wind in the middle Atlantic states, passes over lakes for a thousand miles, and is rendered so temperate, that the region immediately to the leeward of lake Erie has the mildest climate of any part of the United States, of the same latitude. In crossing the Alleghenies, this current is deprived of a portion of its heat; but still, perhaps, is generally as cold a wind at Cincinnati as at Philadelphia.

To take, however, a correct view of this subject, we must not merely advert to the relative prevalence of the south-west and north-west currents in the two regions, but extend our enquiries to all the *southern* and *northern* winds. From the best authorities to which I have been able to refer, it seems that these, in the Atlantic states, blow about an *equal* number of days in each year. At this place, it appears from the preceding tables, that the southern are to the northern as 322 to 256—in other words, that the former prevail over the latter by nearly 20 per cent. or one-fifth; too small a predominance to produce any striking difference of heat in the two regions; and the effect of which is supposed to be diminished—first, by the circumstances connected with the south-west and north-west winds, as just mentioned; second, by the reduction of temperature in the south-east, east, and north-east winds, upon the Alleghenies. But it is doubtless true that the same parallels are somewhat colder east, than west of the mountains; the causes of which appear to be—1. The equality of the northern

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and southern winds in the former, and the preponderance of the southern in the latter; but this, as we have just seen, produces much less effect than is generally supposed. 2. The situation of the mountains—west of the Atlantic, and east of the interior states. On this continent, in the latitude of these states, as well as in the temperate zone generally, the western winds predominate much over the eastern; which compensates for an opposite movement between the tropics. At this place, the former are to the latter nearly as two to one. The Atlantic states are therefore to the leeward, and the interior states to the windward of mountains 3000 feet high; the atmosphere of which is brought down twice as often on the former, as the latter. Hence it appears, that the temperature of the maritime states is sunk by the mountains; and not that of the western states raised by the Gulph of Mexico. 3. The greater elevation of the interior region. 4. The deeper snows of the maritime district. These are generally brought by the north-east wind from high latitudes, and when they are dissolved, absorb a large quantity of heat from the atmosphere, earth and all surrounding bodies, which becomes latent and flows out of the country with the water that it produces, reducing the temperature of the surface in proportion to the depth of the snow.

The interior have not only been declared much warmer than the eastern states, in the same latitudes, but denounced as liable to sudden and extreme changes, in a degree entirely unknown in the latter. This opinion I suspect to have arisen in part from the report of immigrants, who upon settling in this *new* country, have had their curiosity awakened,

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and become, for the first time in their lives, attentive to natural appearances. They have then gone on to compare the sudden changes of this climate, with those of the climate left behind, but which, unfortunately, they never observed; and of course decide in its favor. The thermometers of the two countries indicate no material difference on this point, as appears from what follows. Mr. Volney states the annual range of the mercury in Pennsylvania, on an average, at 100°. Mr. Legaux even makes it more: at this place, as has been stated, it is exactly 100°. The extreme range, taking the cold in one year and the heat in another, in Pennsylvania, according to various authories, is about 120 degrees; the difference in this country, in the course of 25 years, has not exceeded 116°. The difference between the warmest and coldest times of each day in the year, I have found, by comparing the manuscript journal of Mr. Legaux with my own, is at least as great on the Schuylkill as the Ohio. Professor Day has kindly furnished me with a statement of this difference, at New-Haven, in 1809 and 1810, from which I find, that the daily changes from cold to heat were about one degree greater at this place than that; but the opposite changes were 2 1-4 degrees greater there than here; and at a short distance from the sea-board, the difference would be still more striking. An enquiry into those sudden and irregular reductions of temperature, which are every where deprecated, would give results in no degree unfavorable to this country. No fall of the mercury at this place has ever exceeded 20° in an hour and a half, which Dr. Rush states to have taken place in Pennsylvania. The Doctor also asserts, that

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the thermometer has fallen 41 1-2°, and Mr. Legaux saw it fall 47°, in 24 hours; which is five degrees more than any depression ever observed here in the same length of time. Finally, Dr. Rush declares that there is but *one* steady trait in the character of the climate of Pennsylvania, and that is, *it is uniformly variable.* From all these evidences, and from the fact that consumption, rheumatism, and other diseases ascribed to changes of the weather, are less frequent here than in the east, I think the opinion that this climate is more changeable than that of corresponding latitudes in the maritime districts, is proved to be without any sufficient foundation.

The comparative estimate of the winds of the eastern and western states, has been in a great degree anticipated, but a short recapitulation may not be unprofitable. The prevalent winds of the interior, come from between south and west. Some of them are from the Gulph of Mexico, but the greater number appear to consist of air which in conformity to a general law, is moving eastwardly, and suffers deflection to the north by the vallies of the Mississippi and Ohio. The winds between north and west are next in prevalence, and consist of two varieties—that which attends or follows thunder gusts and other storms, and is supposed by Mr. Volney to descend from the higher regions of the atmosphere; and that which comes from beyond the sources of the Mississippi, and frequently continues for several days. The prevailing winds of the middle Atlantic states are between west and north. They consist of the real northwest, which traverses the lakes and loses much of its rigor, which, however, it reacquires in ascending the

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Alleghenies—of the mountain or alpine atmosphere, frequently rolled down towards the ocean—and of the south-west wind of the interior, converted by the vallies of the eastern rivers into a direction north of west. The west wind of both regions possesses nearly the same qualities; but from having traversed an additional range of mountains in reaching the Atlantic states, must be colder and drier there than here. The east, south-east and north-east winds of those states, taken together, prevail more, and are warmer and damper than in the interior.

The violent north-east and south-east storms of the Atlantic states, are unknown in the western. In the quantity of water that falls in the two regions, there is probably not much difference. The south-west wind is the cause of great rains in the latter, and the north-east of still greater, perhaps, in the former. In this latitude, more rain falls west of the mountains, and more snow east of them. In the interior, there is more cloudy weather, and greater atmospheric humidity. In thunder gusts, and other electrical phenomena, in droughts, and in the periods at which most agricultural operations are performed, there is perhaps no material difference.

It remains to be acknowledged, that this comparison is only an imperfect outline. The observations made at this place are defective in many respects, but if much fuller, they could not, of course, indicate the climates of the surrounding region. The observations made in Philadelphia, with which those made here have been in part compared, are not the most proper for that purpose, inasmuch as the extremes of temperature in a city

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are less than in the adjoining country. To the observations of Mr. Legaux, I have been obliged continually to refer. They were, I do not doubt, made with accuracy; but from the unexpected result of the comparison, there is much reason to apprehend that the situation of his thermometer, or some other circumstance, has caused him to assign to Springmill a higher temperature than it really has. It is to be hoped that some eastern meteorologist, who possesses more accurate information on the climate of that region, than can be attained by a person resident in this, will undertake such a comparison as the observations made at this place would support.

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CHAPTER III.

CIVIL TOPOGRAPHY.

PROPRIETORS.

CINCINNATI is built upon one entire and two fractional sections; numbered 18, 17 and 12, in the fourth township and first fractional range, as surveyed by the patentee, John Cleves Symmes. The two first of these, viz. the entire section No. 18, and the fraction No. 17, lying between it and the river, were sold by the patentee to Matthias Denman, of New-Jersey, whilst they were still a wood. Not long after this purchase, Denman transferred to Robert Patterson and John Filson, of Kentucky, an undivided third part each, making them joint proprietors with himself; but Filson being killed by the Indians, before complying with the terms of this bargain, his interest reverted to Denman, who sold it to Israel Ludlow, of the same state with himself. A plan for the intended town was then designed, and in January 1789, Mr. Ludlow executed a survey of that part which extends from Broadway to Western Row. The proprietors then proceeded to sell the lots, and in conformity to a previous arrangement, the purchasers received their deeds directly from J. C. Symmes. In the ensuing year the patentee laid out several blocks of

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lots on the fraction No. 12, lying east of the first town plat. In the year 1808, the reservation around Fort Washington was divided into lots by the Surveyor General, acting under the direction of the Secretary of the Treasury, and sold at public auction by the Register and Receiver, on the 2d of March. In addition to these original owners, several persons have since divided out-lots, or tracts adjoining to the first town plat, and are therefore to be considered as proprietors.

PLAN.

PHILADELPHIA seems to have been the model after which that portion of this town first laid out, was planned. Between Broadway and Western Row there are six streets, each 66 feet wide, running from the river north 16° west, and lying 396 feet asunder. These are intersected at right angles by others of the same width, and at the same distance from each other; except Water and Front streets, and Second and Third streets, the former of which are nearer, and the latter, on account of the brow of the *Hill*, more distant. Not a single alley, court, or diagonal street, and but one common, was laid out. The blocks or squares were each divided into eight lots, 99 by 198 feet. except those lying between Second and Third streets, which made ten lots each; and those between Front and Water streets, the size of which may be seen by a reference to the frontispiece. The out-lots, 81 in number, contain four acres each, and lie chiefly in the north of the town. This plan was not deposited in the public archives for record until the 29th of April, 1802. The streets in that part of the town laid out by John C. Symmes, are but 60 feet

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wide. Those intersecting the river run north 44 degrees west, and lie at the same distance from each other as the streets in the original town; but the cross streets are nearer, and hence the lots of this quarter are shorter. The plan of this survey was not recorded by the proprietor till the 12th of September 1811. The reservation of the General Government was surveyed so as to connect the plats just described. The different subdivisions will be best understood by a reference to the engraved plan.

The DONATIONS by the original proprietors are, a tract between Front-street and the river, extending from Broadway to Main-street, for a public common; and a square west of Main-street, between Fourth and Fifth streets. The south half of this was conveyed to the First Presbyterian Congregation; and the other to the Commissioners of the county; an amount in each case, nearly equal to the value of the ground, being paid.

PRICES OF LOTS.

For several years after the settlement of this place, the lots along the principal streets were sold for less than $100 each. They gradually increased in price until the year 1805, when, from a sudden influx of population, they rose for a short time with rapidity. Their advancement was then slower, till 1811; since which the rate of increase has been so high, that for a year past the lots in Main, from Front to Third streets, have sold at $200 per foot, measuring on the front line; from thence to Sixth-street, at $100; in Broadway, Front and Market streets, from 80 to 120; and on the others, from 50 to 10, according to local advantages.

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Out-lots, and land adjoining to the town plat, bring from 500 to 1000 dollars per acre.

GRADUATION, AND DRAINING OF THE STREETS.

One part of the town being elevated from 40 to 60 feet above the other, it has long been an interesting question, whether the streets running from the river should be graduated to a steep or gentle ascent. The latter method has at length been adopted, and Main-street rises by degrees from Second to Fifth street. The earth and gravel at the intersection of Third street on the brow of the *Hill*, and beyond it, as far as Fifth-street, being hauled and washed down to raise the surface below. The angle of ascent varies, by estimation, from 5 to 10 degrees. Broadway, Sycamore & Walnut streets, are partly completed on the same plan. To the constant change of level which the streets have undergone for many years, from the descent of gravel into the *Bottom*, is to be ascribed the want of pavements and side-walks, which the town so strikingly exhibits. Preparations are making for the pavement of Main-street, from the river to Fourth-street, the ensuing year; which will no doubt be followed by a general improvement of the town in this respect.

Concerning the points at which the water falling on the town plat should be discharged into the river, there are two opinions. The first and most natural is, that it should be conducted down Second-street, and emptied into the river below the town, through the same ravine which formerly carried it off. The other opinion is, that each street running to the river should be so graduated as to convey its own water. But the obvious

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injury which the banks, the beach and the water would sustain, from the discharge of these sluices of filth immediately opposite the town, together with the enormous expense attending it, seem to be procuring for the other method a general preference; and it is probable that all the gutters west of Broadway will be discharged into a common sewer in Second-street, along which in an open canal the water now indeed runs.

It has been already stated, that the north-west part of the Bottom is occasionally inundated by great floods of the Ohio. To prevent this, it has been proposed to throw up a *levee* along the western border of the town plat. The cost of this could not be very great, as it would not have an average height of more than six feet, nor exceed two hundred yards in length; and having no current to stem, it need not be very strong. No measures, however, have yet been taken to effect this important object.

MATERIALS FOR BUILDING.

Cincinnati is eligibly situated for obtaining these. The beds of Licking and the Ohio afford excellent limestone, which, however, can only be quarried when those rivers are low. Marble of a fine quality can be brought by water from the cliffs of Kentucky river; and freestone of a grey color and good texture is already freighted, for a small sum, from near the intersection of the Big Sandy and Scioto with the Ohio, where inexhaustible quarries exist. The clay of the lower part of the town makes excellent brick, about five millions of which are annually used in this place. The lime afforded by the common limestone is dark colored,

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but the silicious limestone pebbles, which are abundant in the alluvial grounds, make lime of a fine quality and pure white. Oak, ash, poplar, walnut and other native timber trees, squared or sawed into boards, plank and scantling, are brought to market in waggons, boats or rafts, and delivered on moderate terms. But the Allegheny mountains furnish the most valuable, and must long continue to afford the most abundant supplies of timber. From those mountains, the white pine, either in the form of logs, boards or shingles, is annually floated down in immense quantities, and sold in all the towns on the Ohio, at a lower price than domestic timber.

The different kinds of masonry, carpentry, painting, papering, and Venetian blinds, are executed in a firm and handsome style.

BUILDINGS.

On the plat of Cincinnati, there is at this time (July 1815) nearly 1100 houses, exclusive of kitchens, smoke-houses and stables. Of these, more than 20 are of stone, 250 of brick, and about 800 of wood. Six hundred and sixty contain families; the remainder are public buildings, shops, warehouses and offices. The great proportion of frame houses seems to be owing to the vast immigration within a few years—a wooden house can be erected in a shorter time than a brick, and at seasons when brick work cannot be done. The dwelling houses are generally two stories high, and built in a neat and simple style, with sloping shingled roofs, and Tuscan or Corinthian cornices. Several have lately been erected with an additional story, and exhibit, for a new

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town, some magnificence. A handsome frontispiece or balustrade occasionally affords an evidence of opening taste; but the higher architectural ornaments—elegant summer houses, porticos and colonnades, are entirely wanting. Very few of the frame houses are painted, which is the more remarkable, as the timber of which they are built is so perishable as to require seclusion from the weather.

PUBLIC AND MANUFACTURING EDIFICES.

The first COURT HOUSE in this place, stood on the eastern end of the public ground. It was erected in the year 1802, and burned down early in 1814, while a company of soldiers were using it as a barrack. It was built of limestone, on a plan furnished by Judge Turner, in the form of a parallelogram, 42 feet in front by 55 in depth; the height of the walls, including a parapet, being 42 feet. It had a wooden cupola with four projecting faces, arched and balustraded, 20 feet high, terminated by a dome, and resting on a basement 20 feet square. From the ground to the top of the cupola was 84 feet. A couple of two story wings, to be made fire proof, for the purpose of public offices, and connected with the body by corridors, formed a part of the *design* which remained to be executed.

Since the conflagration of this edifice, the Commissioners of the county have sold out, on perpetual leases, the whole of the public ground; and accepted of a lot near the intersection of Main and Court streets; in the centre of which they are now engaged in the erection of a second court house, 56 by 62 feet; with fire proof apartments for the different offices of the county.

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The new PRESBYTERIAN CHURCH is a very spacious brick edifice, measuring 68 by 85 feet. Its eastern and narrower front looks towards Main-street, and is cornered with square turrets crowned with cupolas. From the rear is an octagonal projection, for a vestry. The roof is of a common form. The height from the ground to the eaves is only 40 feet, to the top of the cupola 80, which is less than either side including the towers, and hence the aspect of the building is low and heavy. The stair cases are in the basements of the turrets, and are entered without passing into the house. The inside will be divided into one hundred and twelve pews, and five capacious aisles.

The BAPTIST CHURCH, in Sixth-street, is a handsome and commodious brick edifice, 40 by 55 feet, well furnished with doors and windows, ornamented with a balustrade, and finished inside with taste.

The METHODIST CHURCH, in Fifth-street, is a capacious stone building, one story high.

The FRIENDS MEETING HOUSE, near the western end of the same street, is a temporary wooden building.

The CINCINNATI LANCASTER-SEMINARY, on Fourth-street, in the rear of the Presbyterian church, is an extensive two story brick edifice, built, with some alterations, on a plan furnished by Isaac Stagg. It consists of two oblong wings, extending from Fourth-street, 88 feet deep. Near the front, they are connected by an apartment, for stair cases, 18 by 30 feet, out of which arises a dome capped peristyle, designed for an observatory. The front of this intermediate apartment is to be decorated with a colonnade, forming a handsome portico, 12 feet deep and 30 feet long. The front and each side

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are ornamented with a pediment and Corinthian cornice. The aspect of the building is light, airy, and might be considered elegant, were the doors wider, the pediments longer, and divested of the chimnies, which at present disfigure them. One wing of this edifice is designed for male, the other for female children; and between them there is no connecting passage, except through the portico. The lower stories are finished entire, and calculated for the reception of 900 children. Each upper story is to be divided into three apartments, two in the ends 30 feet square, and one in the centre of 25, with a sky light, and the appurtenances of a philosophical hall. When completed, the whole building can receive about 1100 scholars.

Cincinnati has three MARKET HOUSES—the two older are supported by a double, the newer one by a triple, row of brick pillars. The latter extends nearly the whole distance from Broadway to Sycamore-street, being upwards of 300 feet in length. The others are both shorter and narrower.

The BUILDINGS of the Cincinnati Manufacturing Company, on the bank above Deer-creek, are numerous and extensive; the main edifice is 150 feet long, from 20 to 37 feet wide, and from two to four stories high.

The most capacious, elevated and permanent building in this place, is the STEAM MILL, erected in the years 1812, '13 and '14, under the direction of William Green, an ingenious mason and stone cutter, on a plan furnished by George Evans, one of the proprietors. It is built on the river beach, upon a bed of horizontal limestone rocks, and in high floods is for its whole length exposed to the current. The foundation is

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62 by 87 feet, and about 10 feet thick. Its height is 110 feet, and the number of stories nine, including two above the eaves. To the height of 40 feet, the wall is *battered*, or drawn in; above, it is perpendicular. The cornice is of brick, and the roof of wood, in the common style. It has 24 doors and 90 windows. The limestone with which it was built were quarried at various places in the bed of the river, and measure in the wall 6,620 perches. Besides this, it swallowed up 90,000 bricks, 14,800 bushels of lime, and 81,200 cubic feet of timber. Its weight is estimated at 15,655 tons. Through the building there is a wall dividing each story into two unequal apartments—the one designed for manufacturing flour; the other for receiving wool and cotton machinery, a flax'seed oil mill, fulling mill, and several other machines.

It is equally creditable to the prudence of the superintendent and the temperance of the laborers, that during the erection of this house, not one serious accident occurred.

PRESERVATION FROM FIRE.

The means of accomplishing this, are few and inefficient. They are not therefore introduced on this occasion for imitation, but admonition. In the year 1808, the Select Council purchased a fire engine, and an association called the *Union Fire Company*, comprising nearly all the men in town, was formed. The engine proved indifferent, and the organization of the company still worse. For two years it has not had a single meeting. A second fire company was lately organized, which it is reported, intends to do some good.

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In 1813 a tax was assessed for the purchase of another engine, but it has not yet been obtained. The ordinances of the corporation require each house to be furnished with a fire bucket, but this requisition is disregarded by the majority. They also require every male citizen, between the ages of 15 and 50 years, to attend on the cry of fire; a provision finely calculated, if enforced, to augment the rabble which infest such places. A more important requisition, considering the absence of hose companies, is that each dray man shall furnish at every fire at least two barrels of water. Bonfires, and all other conflagrations on the streets or in-lots, are expressly but not successfully forbidden.

WATER.

The borders of the town plat have a few indifferent *springs*, and on the surrounding hills there are others; but none afford water sufficient for distribution. The *wells* are of various depths—those east of Broadway are from 30 to 50 feet, in the Bottom from 40 to 60, and in some of the north-western parts of the Hill, from 20 to 40. Between Third and Sixth streets, and west of Broadway, they are from 70 to 100. The water afforded by some is slightly impregnated with iron, and the whole contain the several salts which abound in the wells of all countries. *Cisterns* are common, and from the general absence of coal in our fires, afford good water. But a large proportion of all that is used, is drawn up in barrels from the river. This is often impure, and requires time to settle; but for most domestic purposes, it is preferred to well water. The proprie-

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tors of the steam mill contemplate distributing water from the river over the whole town; a plan so interesting, that its execution will constitute an important era in our public improvements.

FUEL.

Wood is the chief article of fuel at this place. Beech, ash, hickory, sugar tree, oak, red maple, honey locust and buckeye, are most in use. The first, from its excellence and profusion, will long continue to be burnt in larger quantities than any of the others. Many teams are constantly employed in hauling wood into town from the surrounding hills; but the principal part is rafted and boated down the Ohio and Licking rivers —the channels through which this important article will be mainly received in future.

As no coal has been discovered near to Cincinnati, but little of it is yet consumed here, except by manufacturers. It is brought from Pittsburgh, and sold on the river shore at 10 or 15 cents per bushel. The English chaldron seems to be unknown in the measure of this article on the Ohio.

MARKETS.

Cincinnati has four market days in each week; two mornings at the small market house between Main and Sycamore streets, the oldest in town; and two afternoons at the market house in Fifth-street. That between Broadway and Sycamore-street, is not yet attended.— The Town Council have enacted a long and complicated ordinance regulating the markets, and keep an officer termed a clerk to carry it into effect; but violations

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are constantly suffered to pass unnoticed. At one or the other of these market houses, fresh meats can be had, except in the midst of winter, on every day in the week but the Sabbath. On the regular market days, however, the shambles are much more abundantly stored, and exhibit beef, veal, pork and mutton. The last is of superior excellence; the first, tho' generally good, is said to be inferior in flavor to that of the maritime states, which if true, is no doubt to be ascribed to a difference in the mode of fattening. The poultry is fine. The supply of fish is not great, tho' in the Ohio they are abundant. Perch, pike, eel, yellow-cat and sword-fish are most esteemed—to these may be added the soft-shelled turtle, which is considered a great delicacy. Venison is brought from the woods, during the proper season; and bear meat is now and then offered. The quantity of butter and cheese is in general not equal to the demand, and much of both is of an inferior quality, which arises from the want of better dairies and a greater number of good cows than have yet been introduced into the fertile pasture grounds of the Miamies. Of vegetables, our markets afford an abundance. Among these, are a great variety of fruits, both native and cultivated. Of the former, blackberries, crab apples, pawpaws, fall, winter and fox grapes, mulberries, plumbs, wild cherries, cranberries, and the nuts of the walnut, hickory and chesnut are the principal. Of the latter may be enumerated many fine varieties of apple, peaches of a delicious flavor, pears, cherries, plumbs, quinces, raspberries, currants, gooseberries, strawberries, grapes,*

* These are either brought from the vineyard of gen. Taylor, in Newport, Ky. or the more extensive plantations at Vevay, in

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and various kinds of fine melons. All the culinary roots, herbs and pulse of the middle states, with the sweet potatoe of the south, are plentiful and delicious.

Within four years, the prices of many articles in our markets have advanced; which indicates a rate of increase in the population of the town greater than that of the surrounding country. The effect of this will be, an increase in the number of grazing farms, the erection of larger dairies, and the cultivation of more extensive gardens, for the whole of which the vicinity of this place is most eligibly situated.

MANUFACTURES.

As this town is *older* than the surrounding country, it has at no time had a surplus of laboring population or of capital. The former have been required to assist in clearing and improving the wilderness; the latter has been invested in lands, which from their low price and certain rise, have held out to capitalists a powerful inducement. The conditions which are said to constitute the basis of manufacturing establishments, have not, therefore, existed in the same degree as if the town had been *younger* than the adjoining country. Notwithstanding this, some progress has been made, as will

the Indiana Territory. This place is chiefly inhabited by a body of immigrant Swiss, who employ themselves in little else than the cultivation of the vine, the manufacture of wine, and the distillation of spirits. Their wine has made its way into all the principal towns of the western country; but from some defect in its preparation, keeping, or the quality of the grape from which it is made, most likely the former, it is apt to become sour.

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appear from the following sketch, which embraces the manufactures most worthy of notice.

Cincinnati has no iron foundery; but is well supplied with blacksmiths, who fabricate in a neat and substantial manner, every article which those tradesmen usually make, and many others which belong to the whitesmith. Several shops are devoted to the manufacture of cut and wrought nails, which are made in sufficient quantities for the town and adjacent settlements. Stills, tea kettles and other vessels of copper, with a great variety of tin ware, are made in abundance. Rifles, fowling pieces, pistols, dirks and gun locks of every kind are manufactured. It is six years since a manufactory of cotton and woollen machinery was established, in which time 23 cotton spinning mules and throstles, carrying 3,300 spindles; 71 roving and drawing heads; 14 cotton and 91 wool carding machines; besides wool spinning machinery to the amount of 130 spindles; twisting machines and cotton gins, have been made. Plated saddlery and carriage mounting of all kinds, many different articles of jewelry, and silver ware of every sort—after the most fashionable models and handsomely *enchased*, are manufactured. Swords, dirks, &c. are mounted in any form, and either plated or gilt. Clocks of every kind are made, and watches repaired.

Sills, chimney pieces, monuments, and in short all the varieties of stone cutting, are executed with neatness and taste. Common pottery, of a good quality, is made in sufficient quantity for home consumption. A manufactory of green window glass and hollow ware, is about to go into operation; and will be followed by

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another of white flint glass the ensuing summer. Clean sand, of a beautiful white color, has been found in abundance near the mouth of the Scioto; but no clay proper for crucibles has been discovered as yet on the Ohio, and that article has to be brought from the state of Delaware.

The principal manufactures in wood are the following:—sideboards, secretaries, bureaus, and other articles of cabinet furniture; all of which may be had of a superior quality, made either of our beautiful cherry & walnut, or of mahogany freighted up the Mississippi. Fancy chairs and settees, elegantly gilt and varnished. Waggons, carts and drays; coaches, phætons, gigs and other pleasure carriages, trimmed and ornamented. Plane stocks, weaver's reeds, and the different productions of the lathe, comprehending wheels, chairs, screws, &c. The various kinds of cooper's work, for the execution of which a machine has been erected and is now in full operation. The author of this invention is William Baily, of Kentucky, who in 1811 obtained a patent. The power is given by one or two horses, which with a man and a boy can dress and joint, in a superior manner, the staves necessary for one hundred barrels, hogsheads or pipes, in twelve hours. It can also be employed in shaving and jointing shingles, with equal advantage. The proprietors of the establishment in this place are making arrangements for the exportation of dressed staves to New-Orleans.

To the productions in wood may be added, the STEAM SAW MILL, erected on the river bank, below but adjoining the town. The principal building is a strong frame, 70 by 56 feet, and three stories high. The

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engine drives four saws in separate *gates*, acting at the rate of 80 times in a minute, making the product of each saw about 200 feet of boards an hour. The carriages run upon *cast racks*, are propelled by the improved *short hand*, and *gigged* backwards by *bevel wheels*, in the manner of the best mills. The logs to be sawed are chiefly brought in rafts to the beach, and drawn up the bank and into the mill by power from the engine. Other branches of business will be carried on in this establishment. The engine is estimated at 20 horse power, and of Evans' patent, except the condenser, which the proprietors have abandoned, as being attended with a degree of trouble and expense altogether disproportionate to its advantage. In place of this, they pour on the waste steam a current of cold water, which becoming instantly heated, is employed to replenish the boilers. The Steam Mill Company, and Cincinnati Manufacturing Company, have adopted the same alteration, with great success.

There are four cotton spinning establishments, most of them small. The whole contain upwards of 1200 spindles, which are moved by horses. Wool carding is performed in several places; and an extensive woolen manufactory, designed and calculated to yield 60 yards of broad cloth per day, will be in operation the ensuing winter. It is owned by the Cincinnati Manufacturing Company. The machinery is driven by an engine of 20 horse power. The products of the loom at this place have not been great; but several handsome pieces of carpeting, diaper, plaid, denim and other cotton fabrics, deserve to be mentioned. Cables, the various kinds of small cordage and *spun yarn*, are made in two extensive

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ropewalks. The latter has for some years been an article of exportation. Wool hats are not manufactured here; but fur hats, of a good quality, are made in such quantities, as to give a surplus for exportation to the Mississippi, where they are exchanged for peltry. The tanning and currying of leather is carried on at six tan yards in this place and its vicinity; and the manufacture of shoes, boots and saddlery, is extensive. Skin-dressing in alum is executed with neatness. Trunks covered with deer skin and oil cloth, leather gloves, and a great variety of brushes, are made, of a good quality. Blank books, and all kinds of common and extra binding, are executed with neatness.

The Cincinnati Manufacturing Company have embraced in their plan, manufactories of white and red lead, of such extent as will yield six or seven tons per week. The latter is not yet completed; but the former, which is the third that has been erected between the Mississippi and the mountains, is in operation, and produces white lead of an excellent quality. It must indeed be superior to that brought from the Atlantic states, as it has no mixture of *whiting*, with which the imported white lead is always alloyed.* Arrangements for a sugar refinery were made early in the present year; the buildings have been commenced, and the establishment will be in operation in a few weeks. Tobacco and snuff are manufactured in four different shops. Pot and pearl ash, soap of various kinds, and candles, are made in such quantities as to give a large surplus for exportation.

* See Cooper's Emporium of Arts and Sciences.

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The rectification of spirit and distillation of cordials, are prosecuted to such a degree as to give an ample supply of the latter for domestic use. But these establishments, both in extent and utility, are eclipsed by our breweries. The first was erected on the river-bank, in the lower part of the town, four years ago, and uses the river water; the other was established since, on a smaller scale, and derives its water from wells and cisterns. The two are calculated to consume annually 30,000 bushels of barley. Their products are beer, porter and ale, of a quality at least equal to that of the Atlantic states. Large quantities have been exported to the Mississippi, even as far as New-Orleans, the climate of which they are found to bear very well.

The manufacture of flour, at the steam mill, will be carried on to a great extent. The machinery is all on the plan of Oliver Evans, and driven by an engine of 70 horse power. Four pair of six feet burr stones will be run. Two pair have been in motion for several months, and produce about 60 barrels of flour per day; the whole when in operation will, it is expected, afford 700 barrels a week. The flour is generally of a superior quality.

In the year 1814 a mustard manufactory was erected above the town; but has not yet got into such extensive operation as to supersede the importation of that article.

In the fine arts we have not any thing to boast; but it is worthy of being mentioned, that all kinds of labeling, sign and ornamental painting, together with the engraving on copper of official and other seals, cards of address, and vignettes, is executed with taste and elegance.

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COMMERCE.

Vessels. Flat bottomed boats, keel boats and barges, are the vessels in which the commerce of this place has hitherto been carried on. The first will long continue to be employed in transporting heavy articles down the Ohio; but the latter, it is probable, will be in a great degree superseded by steam boats; of which two kinds are coming into use on the western waters. From these inventions the people on this river anticipate many substantial advantages; more, perhaps, than will be realized; but all must admit, that no country on earth, equally fertile with this, can be more benefited by such boats. The reduction of the voyage from New-Orleans to Cincinnati from a hundred, to thirty days, is equivalent to an approximation of the two places, or to the annihilation of two-thirds of the distance; and superadds to the security and abundance of a temperate interior region, the productions of the south, and of all foreign lands.

Exports. Of these, flour is the chief article, and several thousand barrels are annually exported from the Miami country to New-Orleans. After this follow pork, bacon and lard; whiskey, peach brandy, beer and porter; pot and pearl ash, cheese, soap and candles; hemp and spun yarn; walnut, cherry and blue ash boards; cabinet furniture and chairs; to which might be advantageously added, kiln dried Indian meal, for the West Indies.

Imports. The different kinds of East Indian, European and New-England goods, with several manufactures of the middle states, are received from Philadelphia and Baltimore, but chiefly from the former. It is

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not difficult to foresee, however, that at no distant time the ingress of foreign merchandise will be through other channels. A portage of three hundred miles, over high and rugged mountains, must at all times be more expensive than ascending a navigable river five times the distance. Whenever the General Government shall complete the road from the navigable waters of the Potomac to those of the Ohio, the expense of transportation by land will be so far reduced, that factories and other mercantile houses, will perhaps at no distant period be established on the former of these rivers. Should New-York execute the canal which it has projected, the metropolis of that flourishing state will probably become one of our inlets for foreign goods. But the great emporium of the western country in future must be New-Orleans To effect this change in the current of importation, but three things are necessary—more extensive and wealthy mercantile houses in that city; an improvement in the navigation of the Ohio at the Falls; and an increased number of steam boats. Even under existing circumstances, many articles are brought from thence at a lower price than from the eastern cities; of which coffee, salt fish, claret and some other wines, copperas, queensware, paints, mahogany and logwood, may be cited as examples. In addition to these, we obtain from the state of Louisiana, of its productions, sugar and melasses, cotton, rice, salted hides, and some other articles.

Our imports from the Missouri Territory are lead, peltry and skins—from Tennessee and Kentucky, cotton, tobacco, salt petre and marble—from Pennsylvania and Virginia, bar, rolled and cast iron, with several of

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the manufactures of that metal; millstones, coal, salt, glassware, pine timber and plank. Castings of an excellent quality are brought from Zanesville and Brush-creek, in this state. And furs are obtained from the waters of the Great Miami, Wabash and Maumee.

The goods brought for consumption in this quarter are kept in more than seventy shops. Of these about sixty contain dry goods, hard, glass and queens wares, liquors and groceries. The others are stores for iron, shoes and drugs.

Cincinnati was made a port of entry in 1808, but the business of building ships having been discontinued on the Ohio, no vessel has yet *cleared* from this place.

BANKS.

Miami Exporting Company. This is the oldest banking institution in the Miami country, being incorporated in 1803 for forty years. The original object of the company was the exportation of agricultural produce to New-Orleans; but the charter permitting issues of bank paper, an office for that purpose was opened in this place, and on the 1st of March 1807, the bank went into full operation, all commercial projects having been previously relinquished. The capital is divided into shares of $100, and $150,000 have been paid in by one hundred and ninety persons, the present number of shareholders. The affairs of the company are managed by eleven Directors, chosen annually, one of whom is elected President. The reputation and notoriety of this institution are equal to that of any bank in the western country; and its dividends correspond, having for several years fluctuated between 10

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and 15 per cent. Oliver M. Spencer and Samuel C. Vance are the President and Cashier.

Farmers' & Mechanics' Bank. This was established in the year 1812, and incorporated in 1813 for five years; at the expiration of which time the charters of all the banks in the state, except the Miami Exporting Company, will expire. The shares are $50 each, and the amount of capital as prescribed in the law $200,000. The number of Directors is thirteen; one-third of whom must be practical farmers, and the same proportion practical mechanics. The President is elected out of their own body. The paper of this institution has acquired an extensive circulation, and its dividends have varied from 8 to 14 per cent. The officers are William Irwin, President, and Samuel W. Davies, Cashier.

Bank of Cincinnati. This was founded in 1814, and made its first issues of paper in the month of June of that year. Its shares are $50 each. Eight thousand eight hundred have been sold, to three hundred and forty-five persons. $140,000 have been paid in. It has not yet been chartered, and is governed by twelve Directors, chosen annually, one of whom is declared President. Its notes are in excellent credit; and the dividends, for a new institution, very good—having advanced during the first year from six to eight per cent. The President is Ethan Stone; Cashier, Lot Pugh.

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NEWSPAPERS.

The first newspaper printed north of the Ohio river, and the third or fourth west of the mountains, was issued at this place November the 9th, 1793, by William Maxwell. It was on a half sheet royal of quarto size. Its name was THE CENTINEL OF THE NORTH-WESTERN TERRITORY—its motto, *Open to all parties, but influenced by none.* In the summer of 1796, Edmund Freeman purchased the establishment, and changed the name of the paper to the FREEMAN'S JOURNAL, under which he continued it till the beginning of 1800, when he removed to Chillicothe.

On the 28th of May 1799, Joseph Carpenter issued the first number of a paper entitled THE WESTERN SPY & HAMILTON GAZETTE, which was continued by various editors for ten years. The name was then changed by Messrs. Carney & Morgan to THE WHIG; 58 numbers of which were published—when it passed into other hands, and had its title altered to THE ADVERTISER, under which it was continued till November 1811, when it expired.

In September 1810, Mr. Carpenter re-commenced THE WESTERN SPY, which has been regularly published ever since. At present it is of a super royal size, has about 1200 subscribers, and is edited by Messrs. Morgan & Williams.

A paper called LIBERTY HALL AND CINCINNATI MERCURY, was established in 1804 by John W. Browne. The first number came out on the 4th day of December. Its present editors are Messrs. Looker & Wallace, who print it of a super royal size, and have upwards of 1400 subscribers.

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In the month of July 1814, a paper entitled the SPIRIT OF THE WEST was commenced; but continued only for 41 numbers. On the 15th of July 1815, the first number of the CINCINNATI GAZETTE was issued by Thomas Palmer & Co.

None but weekly papers have yet been published here. The offices of Liberty Hall and The Western Spy have each an extra press, for book printing, which is executed with accuracy and neatness. Ten years ago, there had not been printed in this place a single volume; but since the year 1811, twelve different *books*, besides many pamphlets, have been executed. These works, it is true, were of moderate size; but they were *bound*, and averaged more than 200 pages each. The paper used in these offices was formerly brought from Pennsylvania, afterwards from Kentucky, but at present from the new and valuable paper mills on the Little Miami.

POST OFFICE.

As furnishing data for estimating the state of political curiosity and information, this office is worthy of notice. The number of mails that arrive every week is nine; by which are brought for distribution in the town about seventy different papers, making three hundred & fifty sheets. Besides these, a great number of papers and documents, franked by members of Congress, and most of the eastern periodical works, are received through the same channel.

The office was established in 1793. Abner Dunn was the first post master; and his successors have been William Maxwell, Daniel Mayo, William Ruffin, and William Burke, who at present holds the office.

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EDUCATION.

One thirty-sixth part of the state of Ohio has been granted by the General Government for the support of schools; besides two or three townships for college education. Of these donations our legislature is the guardian, and has enacted several laws respecting them. In most parts of the state, the 16th, which is one of the four central sections in each township as originally surveyed, is the one assigned for this purpose. This is the case in the Miami country. In each township there have been, or should be elected, three trustees and a treasurer, who possess corporate powers as it respects the school section; which it is their duty to lease out to different persons, for periods of 15 years, and to divide the rents among the schools of the township, according to their relative number of scholars. What advantage the people of the adjoining country have derived from these donations, I am not prepared to state. To the inhabitants of this place they could be of no benefit, as the township of Cincinnati is fractional, and does not include the section numbered 16. The proprietors of the town must have known this, but they made no donation for the support of education, not even a site for a school house. The business of tuition was therefore generally conducted by strangers, and transient teachers, in rented rooms, till the year 1811; when ten or twelve individuals purchased a small lot, erected a couple of school houses, and employed two or three teachers; but notwithstanding their laudable exertions, this academy has not flourished, and is likely soon to be superseded by an institution, of which I will now proceed to give some account.

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Cincinnati Lancaster-Seminary. A project for establishing in Cincinnati a school on the plan of Joseph Lancaster, of Great Britain, was agitated more than three years ago, by the reverend Joshua L. Wilson, to whom a teacher residing in the Atlantic states had written on this subject. Nothing, however, was done at that time; and early in the year 1814, Edmund Harrison, of the state of Tennessee, who had been instructed by one of the pupils of Lancaster, came to this place and proposed to the Methodist Episcopal Church, of which he is a member, to undertake a school on the Lancasterian plan. His proposition was readily accepted by that public spirited body, and the reverend Oliver M. Spencer drew up a body of articles for the government of the association, under which the school was to be organised. In these articles, no provision was made for instruction in the higher branches of literature; and a majority of the trustees, it was declared, should be at all times members of that church. Exception being taken by some persons both to this provision and defect, a modification was proposed. This, after some negotiation, failed; and a rival institution was formed, under the name of the *Cincinnati Lancaster-Seminary.* By the mediation of the teacher, the two schools, not long after, were united under the same articles, and in the ensuing winter a law of incorporation was obtained. The monies subscribed in 1814 for the benefit of the seminary, amounted to nearly $9000, payable in shares of $25 each. Since the commencement of the present year, about $3000 more have been contributed; and the Banks of the town, with a laudable desire for the promotion of learning, have agreed to

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loan to the institution, on an extended credit, the sums necessary for the completion of its edifice. A suitable site for the building became a desideratum, but this was soon supplied by the Presbyterian congregation, which in the true spirit of christian benevolence, executed to the Directors of the seminary a lease for 99 years, of the ground on which the building is erected, without any other compensation than the privilege of selecting annually for instruction, 28 poor children, to be considered as charity scholars. By the charter and by-laws, the seminary consists of a Junior and a Senior department, each subdivided into a male and a female school. The Junior department to be organised on the plan of Joseph Lancaster; and the Senior according to such plans, and under such teachers and professors as the Board of Directors may choose. The surplus revenue from the Junior department, after defraying its expenses, and deducting the tuition of those who may be considered as objects of charity, is to be applied to the purchase of books and philosophical apparatus for the Senior department. The price of schooling in the former is reduced to eight dollars a year; and in addition to the charities already mentioned, it is provided that if a shareholder upon dying, shall leave his children without the means of purchasing an education, they shall be entitled to a regular course of instruction in the lower department. The institution is governed by seven Directors, elected annually by the shareholders. These Directors may be of any, or of no religious society; they elect a President from their own body, and have the exclusive management of all the pecuniary and literary concerns. Jacob Burnet has been President from the commencement.

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On the 17th of April 1815, one of the lower rooms being completed, a school composed of children of both sexes, was opened, and in less than a fortnight 420 were admitted; when the apartment being sufficiently filled, many subsequent applicants were rejected. By the indefatigable exertions of the teacher, order and method were at length introduced, and the proficiency of the scholars has equalled all reasonable expectation. A second school, on the same plan, for females only, has just been commenced, and promises to be well filled.

The Board of Directors, by a late resolution, have decreed the establishment of a school for children of color, in a separate house; but no teacher has yet been procured.

Cincinnati University. In the year 1806, a school association was formed in this place, and in 1807 it was incorporated. Its endowments were not exactly correspondent to its elevated title, consisting only of moderate contributions; and an application was made to the legislature for permission to raise money by a lottery, which was granted. A scheme was formed, and great part of the tickets sold: they have, however, not been drawn, and but little of the money which they brought refunded. On Sunday the 28th of May 1809, the school house erected by the corporation was blown down; since which it has become extinct.

Miami University. In the year 1809 the legislature of this state, which by an ordinance of the General Government holds the school and college lands in trust, enacted a law creating and incorporating the *Miami University*. By this act, the Governor was authorised

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to appoint three commissioners to fix on the site of the institution; and Lebanon was selected. The succeeding legislature revoked this decision, and by a liberal, if not an unwarrantable construction of its powers, removed the site of the edifice to the land with which the college is endowed, lying, as we have seen, west of the Great Miami, and beyond the limits of Symmes' purchase. By the same disastrous law, the Trustees were directed to lay off a town, which was of course named Oxford, and to sell out on leases as much of the township as they should consider expedient; all of which was so amply performed, that in less than two years nearly one-third of this valuable endowment was disposed of, on terms which will not yield a revenue adequate to the support of a grammar school! It was however to be reduced still lower; and a succeeding legislature passed a law exempting for a number of years those purchasers who might become actual settlers before the year 1816, from the payment of a large proportion of their annual rents.

Previous to this, as if sagaciously anticipating a defalcation, and with the laudable ambition of erecting on the ruins of the wigwam an edifice devoted to literature and the sciences, the Trustees appointed John W. Browne, minister of the gospel, to solicit alms. The reverend missionary set out, and after two years of devious and thorough travelling in the East, returned richly freighted with more than four hundred dollars in cash, besides a ponderous cargo of venerable volumes; great part of which, as being obsolete, worn out, or otherwise unworthy of preservation for a college library,

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the present directors have wisely ordered to be sold at auction.*

In the year 1814, the Trustees authorised the purchase of a quantity of building materials, and contracts were accordingly made for brick and timber; but their successors finding the treasury almost empty, and calculating that the annual revenues for many years would not be adequate to the completion of a building, have suspended further purchases.

Such are the progress and present state of this institution, in the history of which I have been the more explicit, on account of the erroneous information which has gone abroad respecting it. That it will attain to the rank of a second rate college, in the course of the present century, where it is now fixed, no well informed person has the courage to predict. The general opinion is, that both the interests of the seminary, and common justice to the people for whose benefit it was expressly designed, require its restoration to Symmes' purchase; where the funds necessary to the erection of suitable edifices could be promptly raised by subscription; and a college organised in time to benefit the rising generation. Whether this will be done, depends on the wisdom of future legislatures.

* In justice to several members of the Board, it should be observed, that they were opposed to inflicting on their infant seminary the stigma of mendicity. They moreover believed, that the people of the United States had, through their government, made such donations in land for the support of education in this state, as should exempt them from applications for charity.

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LIBRARY.

It was not until the year 1809 that any efforts were made towards the establishment of a public library in this place. A petition was then forwarded to the legislature of the state for a law of incorporation, but it proved unsuccessful. In the summer of 1811, a paper was circulated by Judge Turner, who obtained subscriptions for several hundred dollars. A meeting of the shareholders was held, and a constitution adopted, which they ordered to be sent on to the next legislature as the basis of a charter for the society. This was not done till a subsequent session, when a law incorporating the association under the name of the CIRCULATING LIBRARY SOCIETY OF CINCINNATI, was enacted. Owing to various causes, however, the library was not opened until April 1814. Since that time, a second and more perfect charter has been obtained, and the institution is at present in a flourishing state. It has about 800 volumes, which are arranged under the following heads:—*Arts and Sciences—Belles Lettres and Rhetoric—Biography—Botany, Chemistry and Medicine—Drama—Education—Geography—History—Law—Metaphysics and Moral Philosophy—Natural History—Natural Philosophy—Novels—Philology—Poetry—Politics—Theology—Veterinary Art—Voyages and Travels—Miscellanies, and continued Periodical Works.*

Among the more valuable scientific books, are *Rees' Cyclopædia* and *Wilson's Ornithology*. About 60 volumes have been received as donations. The affairs of the society are managed by seven Directors, elected annually, one of whom is designated as President. The library is kept open one day in each week.

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SCHOOL OF LITERATURE AND THE ARTS.

This is an association for literary and scientific improvement; composed chiefly of young men, who formed themselves into a society in 1813, and elected Josiah Meigs, an accomplished scholar, their first President.* Their constitution provides for frequent meetings, at which the exercises are of three kinds: a lecture from the President—an essay from one of the members—and a poetical recitation from another. On the 23d of November 1814, the school held its first anniversary meeting, at which an oration was delivered by appointment. From this discourse, it appears that many interesting lectures and essays have been delivered, and that the infant institution is probably the germ of a permanent and respectable society.

RELIGION.

First Presbyterian Society. This is the oldest religious society of the town, having been constituted, by the reverend David Rice, as early as 1791. Its ministers have been the reverend messieurs James Kemper, ——— Arthurs, Peter Wilson, Matthew G. Wallace, John Davies, and Joshua L. Wilson, the present pastor. In 1807 the church was incorporated, with the style and title of the FIRST PRESBYTERIAN SOCIETY. In 1808, when Mr. Wilson commenced his ministerial labors, the number of communicants was nearly 80—at present it is about 160. As early as the year 1792 or '3,

* This gentleman was at that time Surveyor General of the United States; but is now Commissioner of the General Land Office, at Washington City.

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the congregation erected a house of worship, which has served them ever since. In the year 1812 they obtained an extensive subscription for a new house, which is not yet completed.

The only public cemetery which the town has had at any time, belongs to this society. In the year 1810, the grave yard attached to their meeting house being nearly filled, the congregation purchased a four acre out-lot, which they have generously permitted the public to use as a place of sepulture.

In 1812 a few of the female members of this congregation assembled at stated periods, for prayer and religious conversation. In 1814 they formed the design of associating for other objects, and adopted a constitution, denominating themselves *The Cincinnati Female Society for Charitable Purposes.* Their funds are raised by annual subscriptions, by donations, and by charity sermons, preached quarterly, according to their appointment. Within the last year they have appropriated a sum of money to the support of a mission in Louisiana; another to the support of the Theological Seminary at Princeton, New-Jersey; and a third to the purchase of bibles for gratuitous distribution; besides affording relief to several indigent individuals of their own sex. The number of members is about forty.

Methodist Episcopal Church. This religious society was founded in the year 1804, when it only contained ten members: in the present year the number is about 400! with a large congregation, and several local preachers. The meeting house was erected by subscription in the years 1805 and '6; and has, attached to it, a small cemetery. This house has several times been

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the seat of the annual Ohio Conference, which takes in a part of Kentucky and the Indiana Territory.

First Baptist Church. This was constituted in December 1813, when it had but eleven members. Since that time they have increased to more than thirty, and the congregation has been augmented in a corresponding degree. The first baptism by immersion ever performed in this town, was in the summer of 1814. By the liberality of general Gano, the church has become possessed of a lot in Sixth-street. In the spring of 1814 a subscription was circulated, and a sufficient sum obtained to warrant the commencement of a house of worship, which was opened on Sunday the 2d of July last, by the reverend Alexander Denniston, the present pastor. This society is without any burying ground, the lot on which their building is erected being too small to serve as a place of interment.

In the Baptist congregation at this place there is a Male and a Female Society for the support of Foreign Missions. Their contributions are annually remitted to Philadelphia, and pass into the treasury of *The General Missionary Convention of the Baptist Denomination in the United States of America for Foreign Missions*, whose efforts are chiefly directed to India.

Society of Friends. Until 1813, but few of this sect had immigrated to Cincinnati. During that year, several families arrived from the interior of the Miami country, from Virginia, Nantucket and some other places; and purchased a lot in the western part of the town, on which was a small house, that has been enlarged and fitted up for a place of worship. Early in the ensuing year, a Preparative Meeting for disci-

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pline was opened, by direction of the Waynesville Monthly Meeting, and in a year afterwards a meeting of the latter kind was appointed. There are five Quarterly Meetings, which constitute the Ohio Yearly Meeting. They are named Miami, West-Branch, Fairfield, Salem and Redstone. The Yearly Meeting is held near Mount Pleasant, on Short-creek, in this state. The Cincinnati Monthly Meeting consists of about 32 families. It is without a cemetery, the ground appertaining to the meeting house being too small for that purpose.

Lutheran Society. The German inhabitants of this place, who are chiefly Lutherans and Presbyterians, were united into a congregation in 1814. Its name is the Lutheran Society: its pastor the reverend Joseph Zesline, lately of Philadelphia. They do not yet own a house of worship; but have regular sermons in the German and English languages every Sabbath.

CINCINNATI MIAMI BIBLE SOCIETY.

This was instituted October 11th, 1814, by persons belonging to all the religious denominations of the town. Its object is the distribution of the Scriptures among the poor of the Miami country; particularly those on the frontiers, who are, the society observes, by their local circumstances peculiarly embarrassed in their religious interests. The institution may consist of any number of members, each one paying at least one dollar a year; or fifteen dollars in advance for membership during life. The society commenced its distributions early in the present year.

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Its officers are a President, Vice President, Secretary, Steward and ten Directors. The President is the reverend Oliver M. Spencer.

It deserves to be mentioned, as honorable to the charity of our religious societies, and an example worthy of imitation, that they have reciprocally assisted each other in raising the funds necessary for the erection of their houses of worship.

I have already stated, that the 29th section in each township of Symmes' patent was given by the General Government, for the support of religion. By the laws of this state, it was made the business of the Trustees of the school sections, to sell out the ministerial sections on leases of 99 years, renewable forever; and divide the annual rents among the regular christian churches, according to the number of their members. How faithfully this has been performed in the country, or what revenue the churches have yet received from it, I cannot state. From the fractional section of this township, there has not yet been a dividend; but some monies for that purpose are in the hands of the Treasurer.

MASONIC LODGE.

This was established as early as 1791, under a warrant obtained from the Grand Lodge of New-Jersey, with the title of *Nova Cæsaria Harmony Lodge No.* 10. In 1806 it received a new charter from the Grand Lodge of Kentucky, under the name of the *Cincinnati Lodge No.* 13; and in January 1813, this was superseded by another from the Grand Lodge of this state, in which the original appellation is restored, but the number was changed from ten to two. The magnitude and

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respectability of the society, in the meantime, have undergone many changes. At present it consists of about 80 members. It has no hall; but owns a lot of ground at the north-east corner of Third and Walnut streets, the demise of the late William McMillan; and has in addition a respectable fund in bank stock.

A Chapter of Royal Arch Masons was established in this place about the year 1794, and flourished till 1800, when, losing a number of members, it nearly suffered extinction. In 1812 it was revived, and at this time is composed of forty persons.

STATE OF SOCIETY.

This cannot, of course, be pourtrayed with the same facility and exactness as in older communities. The people of the Miami country, may in part be characterised, as industrious, frugal, temperate, patriotic and religious; with as much intelligence, and more enterprise, than the families from which they were detached.

In Cincinnati the population is more compounded, and the constant addition of emigrants from numerous countries, in varying proportions, must for many years render nugatory all attempts at a faithful portraiture. There is no state in the Union which has not enriched our town with some of its more enterprising or restless citizens; nor a kingdom of the west of Europe whose adventurous or desperate exiles are not commingled with us. To Kentucky, and the states north of Virginia—to England, Ireland, Germany, Scotland, France and Holland, we are most indebted.

Among such a variety, but few points of coincidence are to be expected. Those which at present can be

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perceived, are industry, temperance, morality, and love of gain. With a population governed by such habits and principles, the town must necessarily advance in improvements at a rapid rate. This, in turn, excites emulation, and precludes the idleness which generates prodigality and vice. Wealth is moreover pretty equally distributed, and the prohibition of slavery diffuses labor—while the disproportionate immigration of young men, with the facility of obtaining sustenance, leads to frequent and hasty marriages, and places many females in the situation of matrons, who would of necessity be servants in older countries. The rich being thus compelled to labor, find but little time for indulgence in luxury and extravagance; their ostentation is restricted, and industry is made to become a characteristic virtue.

It need scarcely be added, that we have as yet no epidemic amusements among us. Cards were fashionable in town for several years after the Indian war that succeeded its settlement; but it seems they have been since banished from the genteeler circles, and are harbored only in the vulgar *grog-shop* or the nocturnal *gaming-room*. Dancing is not infrequent among the wealthier classes; but is never carried to excess. Theatrical exhibitions, both by *amateurs* and *itinerants*, have occurred at intervals for a dozen years; and a society of young townsmen have lately erected a temporary wooden playhouse, in which they have themselves performed. But as the tendency of their institution to encourage *strollers* and engross time, has been deprecated by the more religious portion of our citizens; and as the members have failed to realise their antici-

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pations, with regard to the accumulation of a fund for the relief of indigence, they will be likely soon to relinquish the pursuit, and leave their stage and its trappings to some future votaries of Thespis. During the winter, select parties are frequently assembled; at which the current amusements are social converse, singing and recitation—the latter of which has been lately predominant. Juvenile plays and diversions are sometimes resorted to; which are generally such as promote a rational exercise of the mental faculties. Sleigh riding and skaiting are rarely enjoyed, on account of the lightness and instability of the snow and ice. Sailing for pleasure on the Ohio is but seldom practised; and riding out of town for recreation, on horseback or in carriages, is rather uncommon, for want of better roads. Evening walks are more habitual, in which the river bank and adjacent hills—the *Columbian garden*—and the *mound*, at the *west end*, are the principal resorts.

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CHAPTER IV.

POLITICAL TOPOGRAPHY.

Some apology is perhaps necessary for imposing on the people of the Miami country the items comprehended in the following chapter; with nearly the whole of which they must be already acquainted. It is hoped, however, that they will excuse it, from the consideration that persons at a distance, who may contemplate an emigration hither, will be gratified to know something of our political, as well as our social institutions.

POPULATION OF THE MIAMI COUNTRY.

In the year 1790, this did not exceed 2000. In 1800, it was about 15,000. In 1810, the single county of Hamilton, not embracing more than 500 square miles, had 15,204; and the Miami country, excluding that part which lies beyond the state line on the west, had about 70,000, or one-fourth of the population of the state. At present (August, 1815) it cannot be less in this district than 100,000; which is spread over 4000 square miles, giving 25 for each mile. In 1810, the township of Springfield, in the interior of this county, had nearly 58 to each square mile; and could certainly

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support many more;—and that the density of population over the whole tract, in ten years, will equal 50 to each mile, is an expectation warranted by the general rate of increase since 1790; by the uniform fertility of our soil; and by the subdivision and sale of our lands in tracts of 160, and even 80 acres—a regulation, which in the United States, is indispensable to a thick population.

POPULATION OF THE TOWN.

I have not been able to ascertain this, at an earlier period than 1810. It was then 2320. In the latter part of 1813, the Select Council made a census, which gave about 4000. From various estimates, it appears certain, that at the present time it is 6000—nearly 10, on an average, to each dwelling house; a number, which no one, who examines the town, will pronounce to exceed the reality; although it greatly transcend the limits which health and comfort would prescribe. In 1810, the males were to the females as one hundred to eighty-two and a half; and at the present time the disproportion is perhaps still greater—a striking contrast with Rhode-Island, where the former are to the latter, as one hundred to nearly one hundred and five.

NEGROES.

By the ordinance of Congress, passed July 13, 1787, providing for the government and defining the principles on which the people of the North-western Territory, when divided into states, should form their constitutions, it is expressly declared that there shall be neither slavery nor involuntary servitude, except for

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the punishment of crimes, unless with the consent of both the General Government and the people of the Territory. When the constitution of Ohio was formed, the prohibitory language of the ordinance was adopted, and slavery is forever excluded from this state. That the other Territories north-west of the Ohio will pursue the same course, there can be no doubt; and hence this fine river will acquire additional distinction in future, from being made the northern barrier to this execrable practice.

Both the ordinance of Congress and the constitution of Ohio, guarantee the recovery of fugitive slaves; but by the decision of our courts, those brought hither are free from the moment of their arrival. By our constitution, *white* male inhabitants *only*, enjoy the right of political suffrage: negroes are of course excluded from that privilege. By a statute enacted in 1804, and amended in 1807, free negroes are prohibited from settling in this state, without giving bond and security that neither they nor their children shall become public charges; but as this provision is considered unconstitutional, it has, I believe, in no instance, been enforced, and we have all the black population which an unopposed immigration could give. By the same laws, negroes and mulattoes are prohibited from giving testimony against white persons. Whether this be not unconstitutional, as well as the other, may be doubted; but it is generally carried into effect throughout the state.

At the time of adopting our state constitution, it was predicted that we should be degraded by the free negroes of other states, and infested with their runaway

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slaves—neither of which has yet been realized. The *political* distinction between the blacks and whites being abolished, the *social*, it was asserted, would suffer the same fate; but experience has shown, that the contaminating influence of slavery itself is most favorable to that dark effect. In no town of the state is there so great a proportion of black population, as in Cincinnati, where in 1810, it amounted only to 79, making about one-thirtieth of the whole. At present the number of blacks and mulattoes does not exceed 200, counting all shades and ages. They are a thoughtless and good humored community, garrulous and profligate; generally disinclined to laborious occupations, and prone to the performance of light and menial drudgery. A few exercise the humbler trades, and some appear to have formed a correct conception of the objects and value of property, and are both industrious and economical. A large proportion are reputed, and perhaps correctly, to practice petty thefts; but no more than one individual has been punished corporally, by the courts of justice, since the settlement of the town.

MILITIA.

The militia of Ohio are organized in divisions, brigades, regiments, battalions and companies. Those of Cincinnati compose an odd battalion, in the first brigade of the first division. They number about 800; and are divided into five companies, one of which is light infantry. The days for mustering and training are only two in spring, and four in autumn; two of which are for officers alone—the discipline of the whole is of course imperfect, without any prospect of amendment.

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SUPPORT OF THE POOR.

No pauper is by law entitled to support from the township, without a residence of one year. The common mode of maintaining those who are permanent charges, is to offer them annually to the lowest bidder. The funds for defraying this expense, and for the support of poor generally, are raised by an annual tax on the same species of property which is taxed for county purposes.

With the design of extending charity to the needy, who in consequence of their recent arrival here can demand nothing from the overseers of the poor; and to those citizens who are, through misfortune, in want of temporary assistance, a number of charitable persons associated themselves in 1814, under the name of the *Cincinnati Benevolent Society*. They appointed two managers in each ward of the town, and by the voluntary contribution of a respectable portion of the inhabitants, a sum was obtained that has enabled the Society to dispense relief to a number of suffering immigrants. A part of the design, which will perhaps be hereafter executed, is the erection of a *work house*; where those who are unable *entirely* to support themselves, will find assistance, and be compelled to labor according to their abilities. Another important establishment by this Society, would be a *Dispensary*, for the relief in sickness, of those families who in health do not require gratuitous assistance.

CORPORATION.

On the 1st of January 1802, Cincinnati was incorporated by the Territorial Legislature, with the fol-

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lowing limits: viz. Mill-creek on the west; the township line, which lies about one mile from the river, on the north; and the eastern boundary of fractional section No. 12, which extends nearly half a mile above the town plat, on the east. On the 10th of January 1815, this law was superseded by another, which retained the same boundaries. By the latter, the town is divided by straight lines into four wards, in each of which three Trustees are elected for two years. When assembled for the first time, they appoint from their own body, out of the different wards, a Mayor, Recorder, Clerk and Treasurer. The powers delegated to the Town Council are, to pass and enforce such ordinances as may be necessary and proper for the health, safety, cleanliness, convenience, morals and good government of the town and its inhabitants. The tax which they have power to assess on real estate, cannot exceed one half per cent. annually, without a vote of their constituents. On all violations of the ordinances of the corporation, it is exclusively the duty of the Mayor to decide; an appeal being had either to the Town Council or Court of Common Pleas, at the option of the person considering himself aggrieved. The Mayor exercises, moreover, the principal duties of a Justice of the Peace, within the limits of the corporation.

TOWNSHIP OFFICERS.

The boundaries of Cincinnati township are, on the east and north, the same with the corporation; on the west it extends a few miles beyond Mill-creek, until the northern boundary line touches the Ohio. In each township of the state, there are annually elected three

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Trustees, and several subordinate officers; whose duty it is to assess and collect taxes for the support of the poor, repair and improve the roads and streets, select jurors, and generally to superintend the affairs of the township.

COUNTY COMMISSIONERS.

These are three in number, and are elected every third year. It is their duty to levy taxes for county purposes, to superintend the erection of public buildings, and generally to manage the revenues, property and concerns of the county.

RECORDER'S OFFICE.

In each county of our state, there is an office for recording deeds, mortgages, leases, town plats, and such other written articles as it is important to preserve. A certified transcript of any of these, is received in evidence the same as the original. The Recorder is appointed for seven years, by the court of Common Pleas. He receives no salary; and his fees are determined by law.

JUSTICES OF THE PEACE.

These officers are elected for three years. They vary in number in each township, according to the decision of the court of Common Pleas. In this township, they are generally three. In civil cases, the jurisdiction of a Justice extends to 70 dollars; and by consent of parties, to $200. In criminal cases, it is co-extensive with the county; but his only power, except in a few trivial offences, is to recognize the culprit to appear before a higher tribunal.

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COURT OF COMMON PLEAS.

In Cincinnati, which is the seat of justice for Hamilton county, there is a session of this court every four months. It is composed of a President and three Associates, elected by the General Assembly for seven years. It has cognizance of all violations of the statutes of the state, whether civil or criminal, which are not punishable with death. In the last cases, the offender has his choice between this and the Supreme Court. It has also unlimited appellate jurisdiction from the Justice's court, and may be selected as the court of appeals from the Mayor's decision. In these cases, its sentences are not liable to reversal. In all others, they may be set aside by the following tribunal.

SUPREME COURT.

This is held annually, and is composed of three Judges, who visit every county in the state. They are elected for the same period with the last. The causes in this judicature are generally appeals from the court of Common Pleas; but it has original jurisdiction in all capital offences; and in civil cases, where the matter in dispute exceeds $1000. It is a tribunal from which there is no appeal.

The court of Common Pleas has jurisdiction in all cases cognizable by a court of Chancery, in which complete remedy cannot be had at law. The Supreme Court has original concurrent jurisdiction with the court of Common Pleas, where the title of land is in question, or the sum in controversy exceeds $1000; and appellate chancery jurisdiction in all other cases cognizable by the court of Comm on Pleas.

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ATTORNIES AND COUNSELLORS AT LAW.

By our statutes, these are licensed only by the Supreme Court; before which they undergo an examination. Certificates of moral character, and of a regular course of law studies, or of admission to practice elsewhere, are indispensable. No previous residence is necessary; but the applicant must satisfy the Court, by affidavit or oath, that he intends to reside in the state.

CAPITAL PUNISHMENTS.

A penitentiary having been lately erected in COLUMBUS, the capital of our state, the whole code of criminal law has undergone revision. Heretofore, the number of capital offences was five. At present it is but two, murder and treason. At this place there have never been but two convictions of this kind. They were both for murder, and within five years after the settlement of the town. One of the felons was pardoned, and the other executed. They were foreigners by birth, and the latter was attached to the army; but not in such a manner as to be tried by a military tribunal.

POLITICAL IMPORTANCE.

Cincinnati was the residence of the Governor of the North-western Territory from 1790 to 1800. In that year the seat of government was removed to Chillicothe, as being more central.

In 1788 a wooden fort was erected here, which was garrisoned till 1802, and soon after erased. This was the key to a line of similar forts, extending quite to the Rapids of the Maumee; the whole of which, except

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Fort Wayne, were long since evacuated and burnt. For many years, therefore, Cincinnati has not been the site of any political or military establishment, and its position does not favor a prospect of any such distinction in future. Of course, no part of its unexampled progress in population and improvement can be ascribed to political aids, which might hereafter be withdrawn; but the whole has resulted from such natural and commercial advantages, as cannot easily be transferred or destroyed.

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CHAPTER V.

MEDICAL TOPOGRAPHY.

UNDER this head it is proposed to communicate, as fully as possible, such information concerning our diseases, and such notices of the mineral springs within our reach, as a person about to emigrate to the Western country would desire.

SECTION I. *PREVAILING DISEASES.*

Of the diseases connected with climate, we have most of those which are common in the same latitudes, east of the Alleghenies. Some of them, however, are less violent and frequent here than there. Of this kind is the *Pulmonary Consumption;* which, in the Atlantic cities, destroys from a fourth to a sixth of all who die; while in this town, it produces not more than one-twentieth of the deaths. So favorable, indeed, is this place to those who are threatened with Consumption, that a migration to it from the Northern states might be advantageously recommended, when this complaint is about commencing, or not very far advanced. The *Pleurisy* and *Peripneumony* occur every winter; but seldom prevail to any great extent. They are generally

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complicated with bilious affections; which renders the treatment difficult, and makes the use of calomel, in most cases, absolutely necessary to a successful issue. The *Croup* is a formidable disease in this place, annually carrying off a number of children. Like the preceding complaints, it is frequently attended with bilious symptoms; and occasionally shows itself in connexion with Cholera Infantum, forming a very dangerous combination. In general, it does not seem to be a worse malady here than in the East; and I have never seen it of that malignant and epidemic character at Cincinnati, which it exhibited in Virginia in 1799.* *Colds* and *Catarrhs, swelled tonsils, and other affections of the throat*, produced by sudden changes of weather, occur here in the same manner as in the maritime states; but do not appear to be so often followed by consumption. The *premature decay of teeth, pains in the jaw, and tooth ache*, frequent in all variable climates, are, it would seem, much less common here, than in some parts of New-England; as Dr. Hazletine informs us, that they make about an eighth part of all the diseases incident to the people of the Province of Maine. *Rheumatism* occurs; but is not so frequent and formidable as in the Northern states.

Of the diseases ascribed to the exhalations from putrefying animal and vegetable substances; from alluvial ground, and from ponds and marshes, we have perhaps the whole catalogue, with the exception of the Yellow Fever of the Eastern cities. In the country, especially along the water courses, *Remitting* and *Inter-*

* See Medical and Physical Journal, vol. ii.

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mitting Fevers, including *Ague*, prevail every autumn; but are seldom malignant, and generally yield to the treatment elsewhere employed, if resorted to at an early period. In Cincinnati, the annual prevalence of these diseases is less certain, and the *mild* and *malignant Typhus Fevers* frequently supply their places. In the years 1809, '10 and '11, these complaints were prevalent here, without much intermission; but since that time they have been rare.

The diseases to which immigrants are most liable, are bilious and typhous fevers. This is especially the case with the natives of New-England and New-York, who in coming here undergo a change of climate greater than they seem generally to suppose. They should, therefore, endeavor to arrive in the Miami country late in the autumn; and before the ensuing summer, place themselves in the most healthy situations which can be found. Those who intend to reside in the country, should get on upland farms at an early period: those who prefer the town, should choose the eastern and northern portions, which are more exempt from noxious effluvia; and, in the heat of summer and early autumn, expose themselves as little as possible, either to the evening air, or the noon day sun. With these precautions, and a strict regard to the prevention of what is denominated a bilious habit, very few will suffer an attack; but without such attention, *a seasoning*, as it is termed, will most likely be experienced the first summer after an arrival from the North. In the second, whether the first be sickly or not, there is but little danger.

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Next to our fevers, are the different complaints of the stomach and bowels. These prevail chiefly in the summer, as in other parts of the United States, and precede the fevers which have been enumerated. The *Cholera Infantum* is commonly the first which occurs, and sets in with the earliest intense heat. Its greatest prevalence is in June and July, when it frequently proves fatal, particularly in town. It sometimes destroys life in a few days; at other times the unfortunate little sufferer pines for several weeks, when he either dies, or is restored by the frosts of autumn. In the country this disease is less frequent, and so mild as not often to prove fatal. The *Cholera Morbus* occasionally presents itself, at the seasons in which it is more or less prevalent over all the States. A few cases of *Dysentery* occur every summer; and once in two or three years, it is epidemic. When this is the case, its prevalence is sometimes very general, but not often mortal. Now and then it assumes a malignant character; when it is, for the most part, confined to a single family. Upon the whole, this disease appears to be less formidable in this country, than in the Atlantic states. On the head waters of the Great Miami, and in some of the adjoining parts of Kentucky, a disease called by the people the *Sick-stomach*, has prevailed more or less for several years. Its prominent symptoms are, a vomiting upon taking exercise, with chronic debility, lassitude and soreness of the extremities. Sometimes it continues for months, in the same individual; and frequently affects whole families. It is supposed to extend to horses, cows, sheep and dogs, varying in several of its symptoms. It does not often prove fatal, and the people,

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where it is endemic, seem to have learned by experience an efficacious method of treatment. It has been ascribed to some noxious impregnation of the water; to the use, by the animals whose milk and flesh are eaten, of some deleterious plant, and to marsh exhalation—the last of which is the most plausible. For two or three years past, its occurrence has been more infrequent, and it cannot be regarded as constituting any serious objection to the districts in which it prevails. The *Jaundice* is a pretty common disease in this country; but it seldom destroys life. *Inflammation of the liver* is met with occasionally, but not oftener than in the same latitudes of the maritime states. Sore-eyes *(Ophthalmia)* is a disease which now and then becomes epidemic over the whole of this country. It prevails most in the same situations where the ague, and other forms of bilious fever abound; and has therefore been referred to the same cause. It does not arise from heat or dust, as it occurs oftenest in shady vallies; nor from the smoke of autumn, as it precedes that phenomenon. It is less frequent than formerly, and will perhaps cease with those diseases which are acknowledged to depend on marsh exhalation. The *Periodical head ach* is a disorder which in this country is ascribed to the same cause, and can be cured in the same manner as ague and fever.

Of the diseases termed *epidemic*, the most frequent in the Miami country are the *Measles* and *Hooping Cough*, both of which have prevailed in Cincinnati every year or two, since 1800. They seldom affect a great number at once, but make their attacks successively for many months, and do not often terminate fatally. The *Mumps* now and then occur, with no unusual symp-

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toms. The *Small pox* has not prevailed here to any extent for a dozen years. There is no institution for preserving and disseminating the vaccine virus; but a great number are annually vaccinated. The *Scarlet Fever* and *Putrid Sore Throat* have been of rare occurrence. About the year 1792, they were prevalent in all the infant settlements of the West, and produced many deaths. From that time till 1809, but few cases were observed at Cincinnati. In this and the two subsequent years, they appeared in an epidemic form, and destroyed a number of children. Since that period, but few cases have been seen, and those were of the mildest kind. The *Influenza*, so extensively prevalent in 1807, attacked the people of Cincinnati about the 1st of October, and disappeared in five weeks, leaving the town unusually healthy. Very few adults of either sex, but many children, escaped it. The number of deaths produced by it was inconsiderable. The Consumption, however, followed in its train, and carried off several persons in the two ensuing years. Since this visitation, we have more than once experienced wide spreading *Catarrhs*, which were ascribed to changes of the weather; but it seems probable that they arose from the same causes with the *Influenza*. The *Spotted Fever* of the Northern states has never prevailed here; but its successor, the *Typhoid Pneumony* (vulgarly called in this country the cold plague) affected a very considerable number in the winters of 1812-13 and 1813-14. In that of 1814-15, but few cases were met with. More men, in proportion, than women or children, suffered; and it generally attacked those who were most exposed to cold and moisture. It proved fatal in a

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number of cases; but was, on the whole, productive of much less mortality than in the North.

Eruptive diseases of the skin are common in the Miami country, and frequently prove obstinate. The *Itch*, and a breaking-out which nearly resembles that complaint, are the most common. These eruptions, however, exhibit a great variety of appearance, and are by the people ascribed to as many different causes. They seem to be more prevalent in the country, than the town. *Worms* are common, and affect children of every age, from one to fifteen years. They seldom prove fatal, unless combined with some other disease. The *Goitre* is an endemic of the western portions of Pennsylvania, and the eastern part of this state; but is unknown here, except in persons who have immigrated while laboring under it. The *Scrophula*, *Rickets* and *Scurvy*, especially the two latter, are rare diseases. *Hysteria*, *Hypochondria* and *Insanity*, are not uncommon. *Dropsy of the brain* is met with occasionally. *Locked jaw* is so rare, that but a single case has occurred here for many years. *Apoplexy* is scarcely ever seen; but *Epilepsy* is more frequent. *Dropsies* occur pretty often, but generally as the consequence of intermitting fever. The *Gout* and *Calculus* are seldom seen, and *Palsies* are infrequent. *Cancers* are uncommon; and no case of *Hydrophobia* has occurred since the settlement of the town. *Canine madness* has not been epidemic for many years. The venomous snakes are so few, that even in the newer settlements a *snake-bite* is uncommon; and in the neighborhood of Cincinnati, almost unknown. The *Coup de soliel*, or stroke of the

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sun; and death from the use of *cold water*, are not more frequent. *Drowning* in the Ohio, is an accident which often happens, and one which we are entirely unprepared to remedy, not having the instruments necessary, either for the recovery of the immersed body, or the restoration of life.

As no bills of mortality are kept in this place, it is not known what proportion die annually; what diseases carry off the largest number; or which of the seasons is attended with the greatest mortality—tho' the two latter may be estimated and expressed in general terms. The Cholera Infantum is more fatal to children than any other complaint. It is most destructive in the second summer; aggravated, no doubt, by teething, and the miscellaneous food with which children begin to be indulged at that age. Convulsions, in the first month after birth, carry off many; and should perhaps rank next to the Cholera Infantum in the number of their victims. After this follows the Croup, which for the most part attacks those between the ages of six months and two years. Of adults, the greatest number die with bilious and typhous fevers; with pulmonary inflammation, and with affections of the liver, stomach and bowels. In the months of June and July, more children die than in any others. The greatest mortality among adults is generally in August, September and October. When epidemics prevail, this however is otherwise, and the midst of winter is now and then attended with a greater number of deaths than any other part of the year.

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Section II. CAUSES OF DISEASE.

CLIMATE.

Neither the extreme cold, nor the extreme heat of this climate, appears to produce many diseases, by its direct operation. If scurvy, goitre and chilblains arise from cold, that of our climate is not sufficient to produce them. The extremities of those who are much exposed in winter, are occasionally frozen; but there has been no instance of death from such exposure in this country. The most obvious effects of our hot weather are, oppression and lassitude in the muscles, with a diminution of appetite—all of which disappear upon the occurrence of a cool day, and are thereby distinguishable from similar affections produced by marsh exhalation. Few persons escape these complaints; but those who have emigrated from higher latitudes are of course the greatest sufferers. Some aged people, and a few valetudinarians, enjoy better health in our hot, than cold weather. Our children, during the great heats of summer, are liable to *rashes*, as they are popularly called—cutaneous efflorescences—which are troublesome, but not dangerous; and disappear upon the first occurrence of cool weather. There is even reason to believe these affections salutary, as they frequently appear on the healthiest children. Cholera Infantum is not produced by the direct action of heat on the system, but is so much aggravated by that cause, as to be generally incurable during the period in which the thermometer fluctuates between 76 and 96 degrees. The variations of atmospheric temperature are a more potent cause of

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disease, than either extreme. But they may in a great degree be rendered harmless, by a careful adaptation of clothing, lodging and fire, to the change. This cause usually produces pleurisy, rheumatism and other inflammations—colds, quinsies, croup, tooth ach, &c. uncombined with other complaints;—but when the prevailing disease is a bilious or a typhous fever, it is commonly found, that the affections produced by changes of the weather, partake largely of the symptoms of the epidemic. The best examples of this combination are afforded by the pleurisy and croup. Variations of temperature, particularly changes from *heat* to *cold*, are sometimes the *exciting* causes of intermitting and other fevers, produced by marsh exhalation. In all these cases, the presence of moisture renders the depression of temperature more injurious. To water, indeed, in the form of dew and fog, it is fashionable to ascribe much deleterious power; but there is reason, perhaps, to doubt the correctness of this hypothesis in all cases, when the temperature of the atmosphere is *steady*.—Fogs and vapors are most abundant, where the decomposition of vegetable matter is greatest; and to this operation should perhaps be attributed most of the diseases which are vulgarly ascribed to moisture.

WATER.

Throughout the Miami country, this is generally *hard*; from holding in solution *carbonate of lime*, *muriate of soda*, *muriate of lime*, and the other salts afforded by a calcareous region. It is apt, therefore, to disagree with emigrants from a country, such as that east of the Alleghenies, where most of the springs afford *soft* water.

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The complaints excited by this cause are for the most part transient; and to the natives of the country, its waters are as salutary and pleasant, as those of the Atlantic states are to the inhabitants of that quarter. Our springs and wells cannot, therefore, be regarded as affording a beverage absolutely prejudicial to health, though it may operate injuriously on strangers for a short period.

MIASMATA.

The Miami country in general being level, ponds and morasses are frequent; especially in the northern part. Most of them might be drained, and certainly will be, at some future period. In the mean time, their environs must continue more or less infested with the diseases which spring from marsh effluvia; and therefore should not be selected for the residence of immigrants, Most of our vallies contain large quanties of alluvion, deposited at various antecedent periods; but whether from these tracts there be any exhalations still arising, which are noxious, is doubtful. The more obvious sources of miasmata, are the marshes formed in these tracts from the annual inundation of their lower portions; and the decaying remains of animals and vegetables deposited in the shores of the streams which flow through them. Whatever may be the truth on this point, it is certain that the vallies are less healthy than the uplands; but from clearing and cultivation, they are annually becoming more salubrious. With respect to Cincinnati, the sources of miasmata may be divided into those which are natural, and those which are artificial; or in other words, into such as are common to it, and other towns

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on the river, and such as are peculiar, and of our own creation. Of the former, we have but two—the drowned lands at the mouth of Mill-creek; and the river beach opposite the town. The former lie so far to the west, and are so much disconnected with the town by an intervening forest, that our summer winds but seldom blow their exhalations over us. Hence very little agency can be ascribed to this cause. The latter is, perhaps, more efficient. The great depressions of the Ohio, in August and September, expose to the sun a quantity of mud, with trees and some animal matter, in a state of decay; the exhalations from which are unquestionably prejudicial. The erection of the steam mill has augmented this cause; by producing, in high floods, an eddy, which annually deposits on the beach, for a thousand feet along the front of the town, a large quantity of filth and mud. Our *artificial* sources of disease are incomparably more deleterious. For many years the descent of gravel along the streets which run from the upper to the lower table, has kept several of the intermediate lots in a state of partial inundation, and caused them to accumulate large quantities of filth. Further west, in the same tract, nearly all the bricks hitherto used, were manufactured; and the pits whence the clay was dug, have been constantly receiving, through the gutter in Second-street, nearly all the wash of the town. Thus have we improvidently created, in the very midst of our population, the most offensive and destructive nuisances. Fortunately, the powers of the new Corporation enable them to compel the removal or abatement of the whole. The great purification has thus at last been commenced; and although its progress

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as yet has neither been creditable to the energy of the Corporation, honorable to the proprietors of those lots, nor beneficial to the public health, there is great reason to hope for relief at no remote period. When this salutary object is accomplished, our public sources of disease will be so few and inefficient, that we may without hesitation, expect to see Cincinnati approximating in healthiness, the driest and most elevated situations, remote from the river.

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Section III. MINERAL SPRINGS.

The Western country is abundantly supplied with *salines*, or salt springs. The richest and most copious are on the bank of Great Kenhawa, in the western part of Virginia. Along with the common salt, *muriate of soda*, there is a large portion of the *muriate of lime*, as I have found by examining the *bittern* or *mother water*, which seems to consist entirely of that salt. In various parts of Kentucky, salt springs were long since discovered, and are frequented by invalids. Several of them contain the *sulphates of soda*, or *magnesia*, and a few afford *sulphurated hydrogen gas*. In the Indiana and Illinois Territories, and in this state, near the Auglaize and Sciota rivers, springs of a similar kind are known to exist. *Chalybeate* waters, consisting generally of *oxide* of iron, dissolved by the agency of *carbonic acid*, are almost as numerous. On the present occasion, we must confine ourselves to those which are situated within such a distance from Cincinnati, as to be accessible to its valetudinarians.

In the bed of Licking, within a mile of its mouth, when the river is low, several copious veins of *chalybeate* water burst out, and have occasionally been resorted to by our citizens. In addition to the *carbonate of iron*, they contain the different salts common in the spring water of this region. They seem to be formed in the alluvial grounds which skirt the river, and may be mentioned as specimens of a numerous class of *chalybeate* springs, with which the alluvial formation abounds. The majority of them, however, are less copious than those under consideration.

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About two miles above the town, on the declivity of the hill, a well has been dug in the loose clay and limestone, which have formerly been precipitated by the undermining action of the current. The water of this well is moderately charged with *sulphurated hydrogen gas*, common salt, epsom or glauber salt and iron, with some useless ingredients. Its effect on the system is that of a cathartic; and from its chalybeate properties in addition, it will unquestionably be found a valuable water. The proprietor intends, by the ensuing summer to make it a *watering place*; for which its topographical situation is highly agreeable. The road leading to it from Cincinnati, lies along the river bank, and its site is healthy, well ventilated, cool, and commands a view of the vallies of Licking and the Little Miami, which are seven miles asunder. In the vicinity of Northbend, marked *Cleves* on the map of the Miami country, there is a spring of a similar kind; but it is less highly charged with saline matter, and is without sulphur.

The most noted watering place in the Miami country, is the YELLOW SPRING, in Green county, 64 miles from Cincinnati, and two from the Falls of the Little Miami. It is a copious vein which bursts from a fissure in the silicious limestone rock; and is, at the distance of a few rods, precipitated into a ravine more than a hundred feet deep. On its passage thither, it has deposited an immense bank of brownish ochre, blended with leaves, twigs and other vegetable matter. The brook which flows along this wild and narrow valley, falls over many successive ledges, which adds much to the interest of the scene. Its margin is fringed

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with a variety of beautiful shrubs, whose broad & heavy foliage affords an agreeable contrast with the slender leaved cedars that adorn the rocks above. A quarter of a mile below the spring, this brook is joined by another, flowing in a similar valley. Along this, a number of excavations have been unsuccessfully made, in search of ores. Among these there is one, five or six feet deep and as many in diameter, which was dug at a period altogether antecedent to the settlement of this country by the Anglo-Americans; but whether by the French or the ancient inhabitants, is quite uncertain. The valley of these united streams exhibits to the geologist the transition from the common to the silicious limestone strata—and a visit to the Falls of the Little Miami will afford several charming prospects. Upon the whole, a tour to the Yellow Spring will amply repay the traveller, if not the invalid; and amuse those who are in health, if it do not in many cases heal the infirm. As to the fountain, it is transparent, emits no air bubbles, and has the temperature of 52 degrees; which is that of the springs in its vicinity. Its taste is that of a slight chalybeate, and the examinations which have been made, indicate it to contain a portion of oxide of iron and carbonate of lime, dissolved by the agency of carbonic acid gas. In its other saline impregnations, it appears to have no excess over the springs of the Miami country generally; it is used for domestic purposes, and its sensible effects on the human system appear to be inconsiderable. In those cases of chronic disease and debility, where a chalybeate is proper, it has however been used with advantage.

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An attempt has been made to prepare a paint from the deposit below the spring, which has been attended with the most flattering success.

The springs most resorted to by the people of Cincinnati, are the *salines* at Big Bone, 22 miles south-west of the town, in the state of Kentucky. They are several in number, and their waters were formerly employed in the manufacture of salt; until the discovery of stronger *salines* on the Great Kenhawa, reduced the price of that article below what it could be afforded when manufactured at these *licks*. The waters at Big Bone hold in solution, besides common salt, the *muriate of lime*, *sulphate of soda* or *magnesia*, and a few other salts of less activity, but no iron. They afford a great quantity of *sulphurated hydrogen gas*, which is constantly escaping in bubbles. From their effects on the sulphates of copper and iron, they appear obviously to contain a portion of *gallic acid*, that is no doubt furnished by the vegetable matter through which the waters rise. The springs are situated near the termination of the back-water of the Ohio, and consequently at a point where great quantities of twigs and leaves (most of which from the nature of the surrounding forest must be of oak) are brought down by the current, and deposited. The temperature of the springs is 57°. Their taste and smell are sulphurous, and offensive to strangers; but the impression made by the gas is transient, and the taste of the common salt afterwards predominates. They do not increase the pulse, but their sensible effects on the alimentary system, kidnies and skin, are great. The action of the two former are very much increased; and the latter is frequently affected

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in a few days with a violent itching, and an eruption of pimples or pustules, which are now and then connected with large *boils*. These waters are, however, neither serviceable nor safe to persons whose constitutions have been long and generally debilitated; whose digestion is bad, from permanent weakness of the stomach; who are affected with head ach, and a general reduction in the energy of the nervous system; or who labor under that species of pulmonary consumption which will not bear depletion. The disorders to which they seem peculiarly adapted, are the torpor, obstruction or chronic inflammation produced by acute diseases in the lungs, liver, spleen, kidnies, in short, any of the viscera; and which have not continued so long that the constitution is exhausted. In these cases, experience has shown them to possess all the efficacy which could be expected in any mineral water. From a pint to a gallon, may be taken daily, according to the strength of the patient, and its sensible effects on the system. The quantity drunk at first, should be small, especially by those of a reduced habit.

The valley in which these springs are situated, is of moderate width, and bounded by a waving and irregular rampart of elevated hills. The scenery is romantic, and not destitute of picturesque features; but the verdure in spring and summer is rather unvaried, and the enchantment of a distant perspective is wanting. These defects in the configuration of the vale are, however, amply compensated by the mighty relics which it entombs. It is now more than half a century since these first attracted the attention of European travellers; and so many have been borne off, that a few fragments only

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remain on the surface, to excite the associations and recollections which this consecrated spot is calculated to inspire. As no other place hitherto discovered in the Union has afforded such quantities of huge animal remains, and as the first ever transmitted to the philosophers of Europe, were collected here, the BIG BONE VALLEY deserves, among naturalists, a classical distinction. It is indeed well worthy a visit from those who can relish the sentiments and the speculations excited by comtemplating the ruins of the largest animal species which have appeared on our globe. And if, according to Mr. Jefferson, the passage of the Potomac through the Blue Ridge, be a scene worth a voyage across the Atlantic—the tomb of the mammoths will certainly reward the traveller of taste and science, for a journey from Cincinnati.

An establishment for the preparation of *artificial mineral waters*, was made in the spring of the present year; and during the few weeks that it continued in operation, it attracted much attention. The proprietor has made arrangements for opening a greater number of fountains the ensuing summer; and will be able, hereafter, to supply the citizens of Cincinnati with as fine a variety of these salutary waters, as any of the large cities can afford.

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CHAPTER VI.

ANTIQUITIES.

No objects in the state of Ohio seem to have more forcibly arrested the attention of travellers, nor employed a greater number of pens, than its antiquities. It is to be regretted, however, that so hastily and superficially have they been examined by strangers, and so generally neglected by ourselves, that the materials for a full description have not yet been collected. The former have too often contented themselves by copying from each other; and the latter have commonly substituted wonder for examination. In the United States, there is indeed no redundance of time or money; but even in this young and parsimonious state, it is not uncommon to see appropriations of both, to objects of greater expense and lesser interest, than a survey of these curious relics. In the reflection, that I shall add one more to these crude and partial accounts, there is not much either to exalt pride or gratify ambition; but as a description of any part of the state of Ohio that did not embrace these vestiges of former population, would by many be considered palpably defective in its plan, the present chapter cannot be omitted. Its imperfections,

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however, will not only fit it for being compared with the treatises that are already extant on the same subject, but make it better correspond with the articles among which it will appear.

Before proceeding to examine the remains which are termed ancient, it may be advantageous to distinguish them, if possible, from those which are evidently modern. In several places are to be found the sites of Indian villages, which are indicated by hearths of flat stones; by ashes, charcoal and calcined earth; and by vast quantities of the broken bones of those animals on which the inhabitants subsisted. About the same spots, but not confined to them, are found various articles fabricated of clay, coal, grit, flint, granite and other hard stones; and which, from their form, are denominated hatchets, axes, chissels, arrow heads, pipes or ornaments. Fragments of earthern ware, also, are picked up, which exhibits, in its composition, pounded muscle and other river shells; and on its surface, many ornamental lines, either straight and parallel, or curved; always formed by indentation or incision. None of it appears to have been glazed; but most of the fragments have, it is obvious, been subjected to a strong heat. All which I have seen, were parts of vessels; and are unquestionably a manufacture of the same species with that carried on by some of the southern tribes of Louisiana at the present time. The remaining works of a modern date, are stone and sometimes earthen tumuli; which are distinguishable from the ancient by their diminutive size; and from being disconnected with any extensive fortifications, or other remains. I have seen three of these Indian graves examined. They were

situated on the top of a high ridge, in Kentucky, where none of the common vestiges of ancient population exist. Two of them were composed of stone, the other of earth. In the latter, the dead bodies had been laid on the surface of the ground, and were surrounded by ashes, calcined loam and fragments of charred wood. They were covered with flat limestones, surrounded by others set edgewise. Over the whole had been erected a circular mound of little convexity, being nearly 36 feet in diameter, and not more than three in height. The others had nearly the same internal construction; but their framers chose to bring up stone from the creeks 200 feet below, rather than erect a mound of earth; and when we take into consideration the tools which they must have used for the latter purpose, their preference of the former cannot excite much surprise.

Having premised these remarks, we are better prepared to understand what relates to the works which are more ancient. Among these, there is not a single edifice, nor any ruins which prove the existence, in former ages, of a building composed of imperishable materials. No fragment of a column; no bricks; nor a single hewn stone large enough to have been incorporated into a wall, has been discovered. The fabrics of wood must have long since mouldered away; and the only relics which remain to inflame curiosity and excite speculation, are composed of earth, with which rude and undressed masses of stone have been sometimes combined. These vestiges consist of mounds, excavations, and embankments or walls, of various forms and dimensions. Cincinnati affords specimens of each. They are extensive and complicated, but not conspi-

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cuous, and have therefore attracted less attention than the relics at some other places. Their relative position may be seen by a reference to the frontispiece. The principal wall or embankment, encloses an entire block of lots and some fractions. It is a very broad ellipsis; one diameter extending 800 feet east from Race-street; and the other about 660 feet south from Fifth-street. But its figure is not mathematically exact. On the east side it had an opening nearly 90 feet in width. It is composed of loam, and exhibits, upon being excavated, quite a homogenous appearance. Its height is scarcely three feet, upon a base of more than thirty. There is no ditch on either side. Within the wall, the surface of the ground is somewhat uneven or waving; but nothing is found that indicates manual labor. On each side of the gateway or opening, exterior and contiguous to the wall, there is a broad elevation or parapet, of an indeterminate figure. From one of these may be traced a bank, not more than twelve inches in height, on a foundation nine times as great. It extends southerly about 150 feet, till it reaches within one or two rods of the border of the upper plain or *Hill*, when it turns to the east, and terminates in a mound at the junction of Main and Third streets, distant nearly 500 feet. From the parapet of the opposite side, no wall of this kind can be traced; but immediately north of it, and at a short distance, are two other shapeless and insulated elevations, more than six feet in height, which, it seems probable, could not have been formed on an alluvial plain, but by the hands of man. Upwards of 400 yards east of this, between Broadway and Sycamore streets, there is another bank, of nearly the same di-

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mensions with the one last described. It can be traced from Sixth to the vicinity of Third street; and is evidently the segment of a very large circle, the centre of which, would lie within or immediately south of that already described. From near the southern end of this segment, to the river, a low embankment, it is said could formerly be traced; and was found to correspond in height, direction and extent, with another, more than half a mile distant, in the western part of the town; but neither of these are now visible. In Fifth-street, east of all that have been described, there is a circular bank enclosing a space 60 feet in diameter. It was formed by throwing up the earth from the inside. It is not more than a foot in height, but 12 or 15 in horizontal extent. In the northern part of the town, between Vine and Elm streets, at the distance of 400 yards from the ellipsis first described, there are a couple of convex earthen banks, 760 feet long, and less than two feet high, connected at each end. They are exactly parallel and 46 feet asunder, measuring from their centres, for two thirds of their distance; after which they converge to 40. In the southern of these banks, about the point where their inclination to each other commences, there was an opening 30 feet wide. The direction of these elevations, as ascertained by the compass, does not vary two degrees from a true east and west line. The site of our town exhibits many other inequalities of surface, which are no doubt artificial; but they are too much reduced, and their configuration is too obscure, to admit of their being described. It is worthy of notice, that the plains on the opposite side of the river have not a single vestige of this kind.

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Of excavations, we have but one. It is situated more than half a mile north of the figure first described, and is not perceptibly connected with any other works. Its depth is about 12 feet: its diameter, measuring from the top of the circular bank formed by throwing out the earth, is nearly 50. Popular speculation, could not fail to make it a half filled *well*; but no examination has yet been undertaken.

The mounds or pyramids found on this plain were four in number. The largest stands directly west of the central enclosure so often referred to, at the distance of 500 yards. Its present height is 27 feet, and about eight feet were cut off by General Wayne, in 1794, to prepare it for the reception of a centinel. It is a regular ellipsis, whose diameters are to each other, nearly as two to one. The longer runs 17 degrees east of north. Its circumference, at the base, is 440 feet. The earth for 30 or 40 yards around it, is perceptibly lower than the other parts of the plain, and the stratum of loam is thinner; from which it appears to have been formed by scooping up the surface; which opinion is confirmed by its internal structure. It has been penetrated nearly to the centre, and found to consist of loam gradually passing into soil, with rotten wood. The fruits of this examination were only a few scattering and decayed human bones; a branch of a deer's horn, and a piece of earthen ware, containing muscle shell. At the distance of 500 feet from this pyramid, in the direction of north eight degrees east there is another about nine feet high, of a circular figure, & nearly flat on the top. This has been penetrated to the centre of its base, without affording any thing but some

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fragments of human skeletons, and a handful of copper beads, which had been strung on a cord of lint.

North-east of the last, at the distance of a few hundred yards, is another of the same figure, but not more than three feet in height; which upon being partially opened, has been found to contain a quantity of unfinished spear and arrow heads, of flint.

The mound at the intersection of Third and Main streets, has attracted most attention, and is the only one that had any connection with the lines which have been described. It was about eight feet high, one hundred and twenty long, and sixty broad; of an oval figure, with its diameters lying nearly in the direction of the cardinal points. It has been almost obliterated by the graduation of Main-street; and its construction is, therefore, well known. Whatever it contained was deposited at a small distance beneath the stratum of loam which is common to the town. The first artificial layer was of gravel, considerably raised in the middle; the next, composed of large pebbles, was convex and of an uniform thickness; the last consisted of loam and soil. These strata were entire, and must have been formed after the deposits in the tumulus were completed. Of the articles taken from thence, many have been lost; but the following catalogue embraces the most curious:

1. Pieces of jasper, rock crystal, granite and some other stones—cylindrical at the extremities, and swelled in the middle; with an annular groove near one end.

2. A circular piece of cannel coal, with a large opening in the centre, as if for an axis; and a deep groove in the circumference, suitable for a band. It has a number of small perforations, disposed in four equidis-

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tant lines, which run from the circumference towards the centre.

3. A smaller article of the same shape, with eight lines of perforations; but composed of argillaceous earth, well polished.

4. A bone, ornamented with several carved lines, supposed to be hieroglyphical.

5. A sculptural representation of the head and beak of a rapacious bird, perhaps an eagle.

6. A mass of lead ore *(galena)* lumps of which have been found in some other tumuli.

7. A quantity of isinglass *(mica membranacea)* plates of which have been discovered in and about other mounds.

8. A small ovate piece of sheet copper, with two perforations.

9. A larger oblong piece of the same metal, with longitudinal grooves and ridges.

These articles are described in the fourth and fifth volumes of the American Philosophical Transactions, by Governor Sargent and Judge Turner; and were supposed, by Professor Barton, to have been designed in part for ornament, and in part for superstitious ceremonies. In addition to these, I have since discovered in the same mound—

10. A number of beads, or sections of small hollow cylinders; apparently of bone or shell.

11. The teeth of a carnivorous animal, probably those of the bear.

12. Several large marine shells, belonging perhaps to the genus *buccinum*; cut in such a manner as to serve for domestic utensils, and nearly converted into the state of chalk.

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14. Several copper articles, each consisting of two sets of circular concavo-convex plates; the interior one of each set connected with the other by a hollow axis, around which had been wound a quantity of lint: the whole encompassed with the bones of a man's hand. Several other articles, resembling this, have been dug up in other parts of the town. They all appear to consist of pure copper, covered with the green carbonate of that metal. After removing this incrustation of rust from two pieces, their specific gravities were found to be 7.545 and 7.857. Their hardness is about that of the sheet copper of commerce. They are not engraved or embellished with characters of any kind.

15. Human bones. These were of different sizes; sometimes enclosed in rude coffins of stone, but oftener lying blended with the earth—generally surrounded by a portion of ashes and charcoal. The quantity of these bones, altho' much greater than that taken from the other mounds of the town, was small in proportion to what was expected—the whole tumulus not having contained perhaps more than 20 or 30 skeletons. With a view of comparing these bones with those of the present Indian tribes, I endeavored to collect and preserve them; but they were generally in such a state of decay, that nothing more could be inferred, than a sameness in the height of the two races. At length I was so fortunate as to procure the skull, nearly entire, of a middle aged man; and have compared it with that of a Wyandot Indian—presented to me by John Johnston, Esq. The facial angle of the ancient, which may be termed the fossil skull, is 74°—that of the Wyandot 76°—and in their length and breadth there is but little difference.

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On placing and examining them, however, in the manner directed by Blumenbach, it is seen that a section made through the forehead and the occiput, would exhibit in the fossil skull almost a regular oval: in the Wyandot, the figure of an egg cut lengthwise, after being flatted at its smaller end. The face of the Indian head, moreover, is shorter and broader than that of the fossil; the upper jaw projects less, and the cheek bones are more distant, broad and prominent. Those of the fossil skull, are, however, of greater height than the cheek bones of most European faces. But what little reliance is to be placed on a single comparison, appears from this—that the upper part of another skull found in this tumulus, exhibits the same horizontal section with the Wyandot, except that the forehead is remarkably convex, instead of being flatted. The fossil teeth which I have seen, were generally sound, and had nothing peculiar in their figure.

No earthen vases were found in the Main-street tumulus; but a small one, composed in part of pulverised muscle shells, was lately dug up and broken to pieces, about 500 feet from that mound. Other vessels have been discovered in similar situations in the country. A comparison of these, as to form, composition and ornament, with the vases made in later times or by distant nations, might lead to interesting results; but the bigotry of Spain in the 16th century seems not to have been more destructive to the historical paintings of Mexico, than the indifference, negligence or idle curiosity of many of our citizens are to these interesting relics.

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The ancient works are generally found in the vicinity of our rivers, and along the Miamies there are many which deserve a full description; but I am able to sketch only the outline of a few.

For some account of those at Piqua, on the western side of the Great Miami, I am indebted to Messrs. J. Johnston and J. G. Telford. The slip of recently formed bottom, or alluvion, next the river, is as usual without any relics; but immediately on the brow of the succeeding and more elevated plain, there is a circular earthen wall, enclosing a space about 100 feet in diameter, with an opening on the side most remote from the river. The adjacent hill, at the distance of half a mile, and at the greater elevation of about 100 feet, is the site of a stone wall, nearly circular, and enclosing perhaps 20 acres. The valley of the river on one side, and a deep ravine on the other, render the access to three-fourths of this fortification extremely difficult. The wall was carried generally along the brow of the hill, in one place descending a short distance so as to include a spring. The silicious limestone of which it was built, must have been transported from the bed of the river, which for two miles opposite these works, does not at present afford one of ten pounds weight. They exhibit no marks of the hammer, or any other tool. The wall was laid up without mortar, and is now in ruins.

Lower down the same river, near the mouth of Hole's creek, on the plain, there are remains of great extent. The principal wall or bank, which is of earth, encloses, I am informed by Mr. Benjamin Van Cleve, about 160 acres, and is in some parts nearly 12 feet high.

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On the west side of this river, two miles below Hamilton, there is a fortification, on the top of an elevated hill of difficult access, which is out of view from the river. It contains, by estimation, 50 acres. The wall is of earth, and generally rises two or three feet, being highest where the ground is most favorable to an attack. Three-fourths of its circumference are bordered by deep vallies: the remainder lies across a level ridge, and here the lines are triple. The interior traverses the ridge nearly in a straight course; the middle preserves the curvature of the fortification, and the exterior resembles the segment of a smaller circle projecting out of the other, in the form of a crescent. There are a few openings in this wall, and one or two piles of limestone are observable near it. There is no ditch on either side. At the distance of two or three hundred yards in front of the crescent shaped bank, there is a mound about 25 feet in diameter at the base, and seven feet high.

On the elevated point of land above the confluence of the Great Miami and Ohio, there are extensive and complicated traces, which, in the opinion of military men eminently qualified to judge, are the remains of very strong defensive works. The under part of the wall, I am informed by General Harrison, is of stone, rudely put together. The upper part is of earth.

In the vicinity of Milford, on the Little Miami, there are some fortifications, for a survey of which, the public are under an obligation to General Lytle, of this town. His plats are engraved and published, without acknowledgement, by Dr. Hugh Williamson, in the appendix to his "Observations on the climate of dif-

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ferent parts of America." The largest of these forts is situated on the top of the first hill above the confluence of the East-fork with the Miami. It consists of a square enclosure, three sides of which have each a single opening, and the fourth two. From this side there is a semicircular projection, covering nearly as much ground as the square itself. It has three openings, at unequal distances. From the junction of these two figures on the west, there run two parallel banks, which terminate at a circular wall, from which two others are extended southwardly. These are divergent, and between them, near their termination, there are three parallel banks connected at the inner end. From the north-east corner of the figure first described, there are discernible for two miles, in the same direction, appearances which indicate a road in former times. The ground at present is raised from one to two feet high. The width of this causeway appears to have varied from 20 to 30 feet. Its surface is convex. In several places strata of limestone and pebbles have been discovered, but in other parts it seems to be composed of earth only. It lies generally on the ridge that separates the rivulets which fall into the East-fork and Little Miami respectively. On the opposite side of the Miami river, above Round-bottom, there are similar works of considerable extent. On the head waters of the East-fork, other remains have been discovered, of which the principal bears a striking resemblance in its exterior to the first of those just described; but within, it differs from any which have yet been examined in this quarter, in having nine parallel banks or long parapets united at one end, exhibiting very exactly the figure of

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a gridiron. In this fort, most of the gateways are guarded by straight or crescent-formed batteries.

I am told by General Lytle, that none of these remains are more than three feet high. They are all composed of earth, and do not in general exhibit any appearance of a ditch.

Further up the Little Miami, in its valley at Deerfield, there are some interesting remains; but those which have attracted more attention than any others in the Miami country, are situated six miles from Lebanon, above the mouth of Todd's-fork, an eastern branch of the Miami. On the summit of a ridge at least 200 feet above the valley of the river, there are two irregular trapezoidal figures, connected at a point where the ridge is very much narrowed by a ravine. The wall, which is entirely of earth, is generally eight or ten feet high; but in one place, where it is conducted over level ground for a short distance, it rises to eighteen. Its situation is accurately adjusted to the brow of the hill; and as there is, in addition to the Miami on the west, deep ravines on the north, the south-east, and south, it is a position of great strength. The angles in this wall, both retreating and salient, are numerous and generally acute. The openings or gateways, are not less than eighty! They are rarely at equal distances, and are sometimes within two or three rods of each other; they are not opposite to, or connected with, any existing artificial objects or topographical peculiarities, and present therefore, a paradox of some difficulty. There is nothing either external or internal, that deserves the name of a ditch. On the declivity, immediately to the south-west of the rampart, there are

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three parallel curvilinear roads or narrow terraces, about 40 rods in length, which command an extensive view both up and down the Miami. Within the fort, near its northern end, there are two semicircular banks, so obscure as to be generally overlooked. The area of the whole enclosure is almost one hundred acres. About twenty poles east from that part of the wall which crosses the ridge, there are two mounds, each nearly nine feet high. They are not far asunder, and walls are extended from them in opposite directions to the adjoining ravines. From these mounds there run to the north-east, along the ridge, a couple of roads or elevations, sixteen feet in width and three in height. They are nearly parallel for a quarter of a mile, when they diverge, but at length unite on the further side of a small and irregular mound. One of the state roads from Cincinnati to Chillicothe passes over the northern part of this interesting work, and thereby affords the traveller an opportunity of examining it personally. The only survey which has yet been made of it, was by Mr. Joel Wright.

Such are a few of the more extensive or curious vestiges of former population in the Miami country. They might be received as specimens of all that our state contains, were not those of the Muskingum and Scioto, from report, still more striking and complicated. A full and interesting description of what Marietta affords, may be found in the Tour of the reverend Mr. Harris; but the others have only been mentioned incidentally. In consequence of this, I am induced to offer the following notice of one that I have superficially examined, altho' it lies beyond the boundaries of the Miami country.

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It is situated ten miles from Chillicothe, on one of the steep and elevated ridges of Paint-creek, under topographical circumstances which will be sufficiently understood by recollecting those of the fortification last described. The wall, which had been conducted along the verge of the hill, is by estimation about a mile and half in length. It was formed entirely of undressed freestone, brought chiefly from the streams 250 feet below, and laid up without mortar or cement of any sort. It is now, like all the walls of a similar kind which have been discovered in the western country, in a state of ruins. It exhibits the appearance of having been shaken down by an earthquake, not a single stone being found upon another in such a manner as to indicate *that* to have been its situation in the wall. In several places there are openings, immediately opposite which, inside, lie piles of stone. In a few spots, the stones are colored by the action of fire—are larger in quantity, and have, blended with them, lumps of cinder resembling that produced in a smith's forge. The surrounding region is abundant in iron ore; and the inhabitants tell of excavations which they suppose to have been formerly made in search of that mineral. However this may be, it is certain that the vestiges of a great population are still discernible in the valley of Paint-creek; and that, upon the whole, there is perhaps no spot in the state of Ohio better calculated for successful researches into the ancient condition of this country.

I shall conclude these imperfect descriptions, with the following general observations.

1. The Lakes, and the Gulph of Mexico, appear to be the northern and southern boundaries of the region

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containing these ancient works. M'Kenzie does not mention them in his voyages and travels to the north-west through the Lakes; but Bartram saw them in various places in Georgia and Florida. Between the Ohio and the Gulph, they appear to be much fewer than between that river and the Lakes. As to their north latitude, 43° may perhaps be the limit. On the east, they are bounded by the Alleghenies; on the west, they extend to the Pacific ocean; but are found of the greatest magnitude and grandeur in some of the southern provinces of Mexico. From that country, indeed, they seem to decrease in size, beauty and regularity, in a ratio corresponding directly to the distance.

2. They are generally found in the vallies of the larger streams; and on the most elevated plains or terraces, which are provincially termed the second and third banks, counting from the river. The first or lowest, which is also the most recently formed, along many of our streams suffers occasional inundation. When some of the works in this country were erected, these new alluvions might not have been formed, or were perhaps liable to *annual* submersion.

3. The forests, over these remains, exhibit no appearances of more recent growth, than in other parts. Trees, several hundred years old, are in many places seen growing out of the ruins of others, which appear to have been of equal size.

For what purpose were these works erected? It must have been obvious to the reader, that most of those which have been indicated, were for defence. What are situated on hills, were perhaps without exception, of this kind. Concerning some of the valley-remains,

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there are grounds for a different opinion. Those at Cincinnati, for example, exhibit so few of the characteristics of a defensive work, that General Wayne, upon attentively surveying them in 1794, was of opinion that they were not designed for that purpose. It was from the examination of valley-works only, that Bishop Madison was led to deny that the remains of the western country were ever intended for defence; and to conclude that they were enclosures for permanent residence.* It would be precipitate to assert, that the relics found in the vallies were for this purpose; and those of the uplands for defence. But while it is certain that the latter were military posts, it seems highly probable that the former were for ordinary abode in times of peace. They were towns and the seats of chiefs, whose perishable parts have crumbled into earth, and disappeared with the generations which formed them. Many of them might have been calculated for defence, as well as habitation; but the latter must have been the chief purpose for which they were erected. On the contrary, the hill-constructions, which are generally in the strongest military positions of the country, were designed solely for defence, in open and vigorous war.†

* It can detract nothing from the reputation of this respectable scholar, but must be regarded as confirming his hypothesis, to remark, that it is the same as that suggested by Dr. Thomas Mollyneux, concerning a part of the Danish antiquities of Ireland; in a Discourse published in 1725.

† This article was written before I had seen or even heard of that interesting chapter in the "Views of Louisiana," where the ingenious author, Mr. Breckenridge, has much more fully and ably supported a similar opinion, the suggestion of which was first made by Professor Barton.

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All the mounds were, I suspect, burying places; but they probably had, as such, various grades and kinds of distinction. Not many of them could have been for public use. In the Miami country, at least, they are too few and small to have served for the mass of the population, at the period when they were erected. Had they been composed entirely of bones, they must have been extended beyond their present size by a single generation. But most of them contain very few bones. They were, perhaps, exclusively the tumuli and monuments of distinguished persons or families. At the same time, the larger might have served for the sites of temples; like the pyramids of the Toultecs and Azteçs in Mexico, as described by Humboldt.

Are these vestiges referable to a nation which has suffered expulsion from this part of the continent, and become extinct, or to the ancestors of the existing Indian tribes? Professor Barton, whose knowledge of the aboriginal inhabitants of this country exceeds that of any other man, originally entertained the former of these opinions. He conceived that the Toultecs, a nation which the hieroglyphical annals of Mexico represent to have migrated across the continent from north to south in the sixth and seventh centuries, were the people who constructed these remains. In the year 1805, Mr. Harris appeared as the advocate of a similar hypothesis; but previous to this period, the Professor seems to have changed his earlier opinions, and in 1796 expressed his conviction, that throughout the whole of North America, there had once been a much more numerous and civilized population than what existed when the interior was first explored by the Europeans;

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and which has degenerated into the present savage hordes. To this position, Dr. Williamson and Mr. Brackenridge have recently lent their support, and have given to it a high degree of plausibility. In the course of some enquiries into the ancient works of the Miami country, I have found nothing adverse to the supposition of the Professor; but several facts have appeared in its support. Of these, the only one which I shall mention, is the existence, in the larger mounds, of fragments of earthen ware, which have in their composition a perfect identity with that fabricated since the discovery of America, even up to the present time, by many of the tribes low on the Mississippi. A single fact cannot establish a theory; but upon viewing this discovery in conjunction with what has been written by the ingenious authors just cited, it must, I think, be acknowledged, that this hypothesis is rendered more plausible than any other.

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CHAPTER VII.

CONCLUSION.

Section I. PROJECTED IMPROVEMENTS.

Under this head I do not propose to mention any other improvements than those which are calculated to facilitate the intercourse between the town and country.

Bridges. Some enthusiastic persons already speak of a bridge across the Ohio at Cincinnati; but the period at which this great project can be executed, is certainly remote. Mean while, in a steam ferry-boat, we might find nearly all the conveniencies of a bridge; and the communication between the opposite sides of the river is so great, even at the present time, that such an establishment would yield a good profit.

A new and permanent bridge across the mouth of Deer-creek is much wanted, and will probably be erected in the course of one or two years; as those to whom this important charge is confided, will undoubtedly be ashamed to neglect it much longer.

There was once a wooden bridge over Mill-creek, near its confluence with the Ohio; but in consequence of a high flood in that river, it was destroyed. In the

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session of 1814-15, our Legislature authorised the erection of a toll-bridge at the same place; which, it is understood, will be commenced the ensuing spring.

Roads. By the law of Congress which provided for the admission of this state into the Union, it was stipulated, that three per cent. of the nett proceeds of the United States' lands within the limits of Ohio, should be applied by its Legislature to the laying out, opening and improving of its roads. The policy pursued by the trustees of this valuable fund has been, to appropriate it on a great number; and, of course, to have not a single good road in the state.* The project of constructing, between the Miamies, from Cincinnati towards the sources of these rivers, a great road, which should at all seasons be equally passable, has been for some time in agitation. It will perhaps be undertaken in 1816, and pass by the nearest route from this town to Dayton. The benefits which an execution of this plan would confer, cannot be fully estimated, except by those who have travelled through the Miami country in the winter season, and have studied the connexions in business between that district and Cincinnati. The salt, the iron, the castings, the glass, the cotton and the foreign merchandise for at least eight counties, would be transported on this road; which would immediately become one of the most important in the state.

* In the year 1809, the Legislature passed a law directing $9000 of this three per cent. fund to be appropriated to other purposes. Against this the officers of the General Government remonstrated; and in the ensuing session a law was passed directing the money to be refunded, with interest.

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An improved road to Columbia is a great desideratum. The present one, for several years past, in the winter season, has been nearly impassable for carriages and loaded waggons; while all the materials for the best turnpike have been at hand, and even constituted one of the greatest obstructions on the route. Two years ago some efforts were made to form a company for this purpose, but they seem to have been ineffectual; and we must patiently wait for an accession of wealth and enterprise. The delay of this undertaking is the more to be regretted, as we are thereby in a great degree precluded from the most agreeable airing which the vicinity of the town is calculated to afford.

CANALS. The points of near approximation between the waters of the Mississippi and the Lakes, appear to be six; not including those which may exist in the vicinity of lake Superior, and have not yet been examined. The *first* of these is in the neighborhood of Presq' Isle, where the highest navigable point of French-creek, one of the branches of the Allegheny, is found within 12 or 15 miles of the Lake. But whether a canal could be dug through the portage, has not been publicly stated. The *second* is between the Cayahoga and Tuscarawa, one of the upper streams of the Muskingum. The portage at this place is not more than a dozen miles; and so certain is it that the two waters may be connected by a canal, that in the law of Congress appropriating a portion of the public lands to the improvement of inland navigation, 100,000 acres were assigned for defraying the expense of this project; but the work has not yet been commenced. The *third* is betwixt the St. Mary and Auglaize, branches of the

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Maumee; and Loramies-creek, one of the most navigable waters of the Great Miami. The relative position of these small rivers may be seen by a reference to the map. The St. Mary is remarkably serpentine, with a general direction towards the north-west; which makes the voyage to the Lake circuitous and protracted. It is said to have an earthen channel, with low banks, and to be deep and narrow. In the course of the year, there are generally five or six floods, when its navigation would be perfectly safe, were it not for the bayous which are then formed. Its junction with the St. Joseph, at Fort Wayne, composes the Maumee. The Auglaize is a shorter river than the St. Mary, and entering the Maumee 60 miles below that stream, affords a much quicker passage into the Lake. It is also a larger river than the one first described; but has a stony channel and a rapid current. In the opinion of gentlemen who have descended both, the navigation of the Auglaize is generally not so safe as that of the St. Mary; tho' at certain seasons it affords more water. The highest navigable points on those rivers, are not more than 20 miles asunder; and between 12 and 18 from the head of navigation in Loramies-creek. The intervening tract is nearly level, and composed of a deep stratum of loam and clay. Which of these streams could be most easily and advantageously connected with our waters, remains to be determined; as does also, the more important question, whether the portage would afford sufficient water to feed a canal. The *fourth* connexion is between sources of the Wabash, and the St. Mary, eight miles above Fort Wayne. When very high, these rivers overflow the intervening lands

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to such a depth, that loaded boats pass over with facility. Of the practicability, therefore, of connecting them by a canal, there can be no doubt; and in the law of Congress just quoted, an appropriation of land equal to that for the Muskingum and Cayahoga canal, was made for this. The *fifth* point of intercommunication is between the Illinois, and the Chicago a southern river of lake Michigan, which I am informed are so connected, that in freshets boats can pass readily from one to the other. For encouraging the improvement of this navigation, the General Government have made the same appropriation as in the cases before mentioned. The *sixth* connecting waters, are the Ouiseonsing and Fox rivers. The former runs into the Mississippi—the latter into Green Bay, an arm of lake Michigan. The portage at this point is said to be short.

Which of these connexions offers the greatest facilities to commercial intercourse, cannot at this time be determined. That between the Chicago and Illinois will, it is probable, be the least expensive; but as vessels in reaching it must pass through the straits of Michilimackinac, it is not likely to be used until the banks of lake Michigan and the Illinois shall become thickly inhabited. The canal between the Cayahoga and Muskingum will be first opened; and must greatly benefit the country watered by those rivers. But in the improvement of the connexion between the Great Miami and Maumee, the people of the western part of the state are most interested. Its utility to the inhabitants of Cincinnati and its vicinity will, however, in a great degree, depend on the execution of another and more

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difficult project; on which some general remarks will close this article.

To discharge a portion of the waters of the Great Miami into the Ohio, at this town, would, confessedly, be a great public benefit; but no proposition on this subject has yet appeared; nor does it seem to have attracted much attention. In the whole course of the Miami, there is perhaps but one point where a canal could be opened; and that is near Hamilton, 25 miles from the mouth of the river, and about the same distance from Cincinnati. In the valley, five miles south of the former town, there is a large pond, which is replenished by the Miami, when that river is high; and out of which, at the same time, arises one of the principal branches of Mill-creek. From this place to Cincinnati, following the meanders of the stream, there is nothing to prevent the opening of a canal. The valley it is true, contains great quantities of pebbles and gravel covered with soil, but by keeping near the hills that bound it, an argillaceous bottom could be had. The difference in level, at low water, between the Ohio at this town, and the Miami at Hamilton, has not been ascertained; but it may be estimated at 60 feet. About four miles from Cincinnati, the canal would have to be carried over Mill-creek, after which it might be conducted along the base of the high lands which border the site of the town on the north, to the valley of Deer-creek, through which it would reach the Ohio. The time when the enterprise and resources of the citizens of the Miami country will be adequate to the execution of this project, cannot be foretold; but when we consider the

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APPENDIX.

EARTHQUAKES.

As the theory of these phenomena is not yet settled, it is important to increase the volume of facts; and for this purpose the following observations, made in 1811, '12 and '13, are offered to the public. It is not supposed that they can interest the general reader, or aid the speculative philosopher, in the same degree as those made where the late visitation was more signal; but they may, perhaps, be found of sufficient moment to justify their publication.

CHRONOLOGICAL TABLE.

December 16, 1811. At 24 minutes past 2 o'clock A. M. mean time, the first shock occurred. The motion was a quick oscillation or rocking, by most persons believed to be west and east; by some south and north. Its continuance, taking the average of all the observations I could collect, was six or seven minutes. Several persons assert that it was preceded by a rumbling or rushing noise; but this is denied by others, who were awake at the commencement. It was so violent as to agitate the loose furniture of our rooms; open partition doors that were fastened with falling latches, and throw off the tops of a few chimnies in the vicinity of the town. It seems to have been stronger in the valley of the Ohio, than in the adjoining uplands. Many families living on the elevated ridges of Kentucky, not more than 20 miles from the river, slept during the shock; which cannot be said, perhaps, of any family in town.

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About 3 o'clock, or 45 minutes after the first, a slight vibration was felt.

At 20 minutes past 7 o'clock A. M. of the same day, occurred a moderate rocking, apparently south-west and north-east, of about one minute's duration, terminating in a strong throe of a few seconds. This was unattended by any sound in the earth or atmosphere.

At 30 minutes past 7 o'clock, or 10 minutes after the last, a slight oscillation.

Between 10 and 11 o'clock A. M. another of the same force.

17th. At 15 minutes before 12 o'clock A. M. a vibration stronger than the last.

18th. About 30 minutes past 11 o'clock A. M. a moderate agitation.

31st. Between 4 and 5 o'clock A. M. a few gentle rockings.

January 3, 1812. A slight vibration, between 2 and 3 o'clock A. M.

From the 3d to the 22d, no vibration, strong enough to attract general notice, occurred; and it was generally believed in Cincinnati, that the earth, hereabouts, was quiet. Others, however, assert, that they felt many slight agitations; which, undoubtedly, was the case; for during that period, shocks were every day felt along the Mississippi.

23d. About 9 o'clock A. M. a great number of strong undulations occurred in quick succession. They continued 4 or 5 minutes, having two or three distinct exascerbations during that time. An instrument constructed on the principle of that used in Naples, at the time of the memorable Calabrian earthquakes, marked the direction of the undulations from south-south-east to north-north-west. This earthquake was nearly equal to that which commenced the series on the 16th ultimo.

27th. At 45 minutes past 8 o'clock A. M. a solitary heave, as strong as any single throe on the 23d.

February 4. About 4 o'clock P. M. a pretty strong agitation.

5th and 6th. During these days, and the nights preceding them, many slight jars and tremors were per-

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ceived by the aid of delicate plumb-lines. They were also perceptible to those persons who were at rest, in situations favorable for nice observation.

7th. At 45 minutes past 3 o'clock A. M. several alarming shocks in rapid succession. The instrument already mentioned, indicated the three principal heaves to be from the south-west, the south-south-west and south-south-east. The last greatly surpassed any other undulation ever known at this place. It threw down the tops of more chimnies, made wider fissures in the brick walls, and produced vertigo and nausea in a greater number of people, than the earthquakes of either the 16th of December or the 23d of January. It was said by some, that this earthquake was preceded by a light and a noise; but this was denied by others, who were awake, and collected in mind and senses.

8th. During most of this day, the earth was (to borrow a term from chemistry) in a state of ebullition; as the gyration, and other agitations of pendulous bodies indicated.

About 8 o'clock P. M. a slight agitation.

At 30 minutes after 8 o'clock P. M. another vibration. Its continuance was nearly a minute.

At 40 minutes past 10 o'clock, a shock considerably stronger than either of the preceding. It was observed to produce in suspended and elevated bodies, a very sensible degree of trembling, but no oscillation; indicating, perhaps, a vertical, instead of the horizontal motion of the previous shocks. Immediately before this shock, I had the satisfaction of hearing, for the first time, a noise, such as preceded, according to the report of some of our citizens, most of the principal earthquakes. It was a peculiar, faint, dull, rumbling or rushing sound, near the horizon, to the south-west. It seemed to approach, but not arrive at the place of observation, and after continuing four or five seconds, was succeeded by the shake. During the remainder of the night, and the next day, the earth was in the same state of tremor which it suffered on the 5th and 6th.

10th. About 4 o'clock P. M. a gentle vibration.

11th. —— 1 —— A. M. another.

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11th. About 6 o'clock A. M. another.
13th. —— 10 ———— another.
—— —— 2 —— P. M. another.
16th. —— 10 ———— another.
17th. At 40 minutes past 3 o'clock A. M. a stronger shock. The undulation south-south-east and north-north-west. About this time a great number of slight tremors and agitations were perceived.
20th. Between 10 & 11 o'clock P. M. a slight shock.
21st. At 30 minutes past 12 o'clock A. M. a short but stronger shock.
22d. Between 3 and 4 o'clock A. M. another slight vibration. These three oscillations were south & north.
March 3. A few slight rockings about 30 minutes past 6 o'clock A. M.
5th. Several short but stronger rockings at 10 minutes past 6 o'clock A. M.
10th. A stronger vibration about 8 o'clock P. M.
11th. A slighter vibration between 2 & 3 o'clock A.M.
April 30 A moderate agitation.
May 4. About 11 o'clock A. M. a slight shock.
10th. —— 11 —— P. M. another.
June 25. In the night, a slight agitation.
26th. About 8 o'clock A. M. two slight vibrations.
Sept. 15. At the dawn of day, a moderate vibration.
December 22. About 3 o'clock P. M. another.
March 6, 1813. About 10 o'clock P. M. a very slight shock.
Decem. 12. Between 10 & 11 o'clock A.M. another.
———— ——— 3 & 4 ——— P.M. another.

CLASSIFICATION OF THE SHOCKS.

The violence of different earthquakes, is best indicated by their efficiency in altering the structure of the more superficial parts of the earth, and in agitating, subverting or destroying the bodies which they support. On a comparative scale, formed from such remarks, at this place, the first shock of the 16th December 1811, that of the 23d January 1812, and the first on the 7th of February, occupy above the rest, a decided

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elevation, and constitute the first class. To the second class belong—the shock at 20 minutes past 7 o'clock A. M. December 16, that on the 27th of January, and that at 40 minutes past 10 o'clock P. M. on the 7th of February. Of the remainder, one half, by estimation, may be referred to a fourth class, composed of those which were felt only by persons *not* in action; and the remainder will constitute a third class, of intermediate violence. The numerous tremors & ebullitions, that were detected by pendulums, and the delicate sensations of a few nice observers, when at perfect rest, may constitute the fifth and lowest order of these multiplied agitations.

GENERAL REMARKS.

1. The original focus of these concussions was the valley of the Mississippi, between New-Madrid and the Little Prairie, in north latitude 36° and west longitude from Washington 12° 30′—but after the second year of their duration, it seems to have ascended the Mississippi to the Ohio, and then advanced up that river about 100 miles, to the United States' Saline; at which place shocks have been felt almost every day for nearly two years.

2. They were vastly more numerous, during the same period, on the Mississippi than the Ohio. Not a single day passed, from the 16th of December to the ensuing summer, without several shocks along the former of these rivers. Even at St. Genevieve, 200 miles above the principal scene, during a period of seventy days, D. Roe, Esq. counted more than 100 shocks.

3. The shocks at Cincinnati, which have been referred to the first and second classes, were generally the most violent on the Mississippi.

4. The kind of convulsion on the Mississippi, was different from that experienced here. The latter, it has already been stated, was generally an undulation: the former, from the most authentic reports, appears to have been a vertical explosion. The cause acted directly upwards, and elevated to the surface of the earth, sand and various extraneous fossils, which had been buried in the alluvion of the river for unknown ages.

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5. The convulsion was greater along the Mississippi, as well as along the Ohio, than in the uplands. The strata in both vallies are loose. The more tenacious layers of clay and loam spread over the adjoining hills, many of which are composed of horizontal limestone, suffered but little derangement.

6. All the principal shocks on the Mississippi, were attended or preceded by an explosive sound; which the people of that region denominate subterranean thunder. This noise was generally heard to the south-west—which my correspondent, the honorable Stanley Griswold (who has made many observations on these phenomena) ascribes to the ground in the vallies of our rivers being lower in that direction.

7. The stronger shocks of this great series were felt in every part of the United States; and their violence was generally in the inverse ratio of their distance from the focus. Earthquakes were experienced, also, during the same years, but not on the same days, in Europe, the West-Indies, and South America.

8. As some time-pieces are set to solar, and others to mean time; and as most of them are inaccurate, it is difficult to determine the precise date of any of the shocks: but from the best information that can be collected, their *absolute* time, in different parts of the United States, was the same, or nearly so.

9. The shocks at the United States' Saline, for a year past, have, as before stated, been almost daily; and are frequently attended with a loud noise underground. But they are so circumscribed in their geographical extent, that but few of them are felt even at Shawneetown, on the bank of the Ohio, only 12 miles distant. As late, however, as the month of June of the present year, several of these concussions were so violent as to be felt at the place just mentioned, at Kaskaskia, and on the Wabash river, 40 miles from its confluence with the Ohio.

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ELECTRICAL AND OTHER PHYSICAL PHENOMENA OF 1811, '12 AND '13.

These, at Cincinnati, were not very extraordinary, but must nevertheless be enumerated, for the gratification of the speculative reader.

There was a greater flood in the Mississippi, in the summer of the year 1811, than had occurred for fifteen years before. Between St. Louis and New-Madrid, many parts of the valley were overflown extensively. This was followed, in autumn, by the bilious remitting and intermitting fever, which prevailed in that quarter to a great extent. But as this was clearly referable to the vegetable putrefaction which was the consequence of that flood, it should not be considered as connected with the earthquakes which followed. In regard to the subsequent diseases in that quarter, both Dr. Farrer, of St. Louis, and Judge Griswold, of Shawnoetown, are of opinion that they have neither been augmented nor modified by those concussions. From attentive observation, I am convinced that the same remark is true of this place.

In the condition of our climate there was nothing extraordinary during the years in which the earthquakes prevailed; but those who may wish to examine it for themselves, can do so by a reference to that article in the second chapter.

Some months before the earthquakes commenced, viz. on the 11th of February 1811, about 3 o'clock P. M. the sun being considerably obscured by haze and clouds, I observed that luminary to be surrounded by two concentric circles, which were imperfect on the side towards the horizon. In the outer circle, in opposite points, there were two iridescent spots at unequal distances from the horizon; in the inner circle there were likewise two spots, the colors of which were more vivid and distinct than the others. This circle was crowned, if it may be so expressed, with a straight luminous streak, the middle of which touched that part of the outer circle nearest the zenith. On the morning of the 21st of January 1812, appearances equally complicated and much more luminous, were observed by the officers

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at Fort Wayne, to attend the sun without change of relative position or diminution in brilliancy, from the time of his rising till 11 o'clock, when they became evanescent, and disappeared entirely by 2 o'clock P. M. So near the surface of the earth were the vapors which produced this singular refraction, that at Cincinnati, distant not more than 120 miles in a straight line, the phenomenon was not visible. In the month of February 1812, the moon was frequently surrounded by a halo, which was once observed to exhibit the prismatic colors. On the afternoon of the 6th of March and 7th of May of the same year, mock suns were visible.

In the year 1811, thunder storms were unusually rare. Now and then a few moderate peals of thunder attended a shower; but I am confident that in the month of August 1800 (a year remarkable for thunder and lightning) there were more storms of that kind, than in the whole of 1811. During the first half of 1812, thunder storms were numerous and violent: many places, indeed, north of Cincinnati, were visited by severe hurricanes. In the second half of the year, they were more seldom. In 1813, the number was not remarkable.

In the winter of 1811—12, many persons observed, or thought they observed, that those substances which are susceptible of electric excitation, gave extraordinary indications of the presence of the electric fluid. I will not vouch for this, but I accidentally observed the leaves of a quire of paper, which had just been rubbed with elastic gum, to adhere with more tenacity, and to display, when separated in the dark, a more luminous streak, at the place of disjunction, than I have since witnessed in repeating the experiment, *apparently* under the same circumstances. On the 6th of February 1812, I had a pointed iron rod, supporting a cork ball electrometer, inserted six or eight inches into the moist earth. It was faithfully observed during two of the shocks which occurred in the night of that day, but not the slightest electrical appearance was perceptible.

The comet became visible on the 5th of September, 1811.

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STATE OF THE ATMOSPHERE AT THE TIMES OF THE PRINCIPAL SHOCKS.

For two days previous to the first earthquake, December 16, the atmosphere was smoky, hazy and cloudy. On the 15th, there was mist, with a gentle south-east wind, and greater darkness than I recollect to have ever seen before or since, in the day time. This state of things continued till in the night, which was proportionally darker than the day. The morning of the 16th was entirely calm, foggy and smoky, with broken clouds moving slowly from the south-west. On the 17th, when a slight shock occurred, the wind was the same as on the 15th, with a copious rain. On the 18th, when a slight shock was felt, the wind was north-west, with snow-falls. The morning of the 31st, a day on which some moderate shocks were felt, was calm, with rain. For two nights before the 23d of January, when one of the principal shocks occurred, the atmosphere was hazy, with a circle round the moon. The 22d was calm; the forenoon cloudy, the afternoon nearly clear. The morning of the 23d was hazy and cloudy, with a very gentle south-east breeze. Two hours after the shock the wind increased, and a copious snow-shower commencing, continued until night. The next day was attended with a thaw. On the morning of the 22d, the thermometer was —5°; on the 23d, 16°; and on the 24th, 38°. On the morning of the 27th, when a shock of the second class occurred, it was mild and calm, with broken clouds. A shock of the third class was felt on the 4th of February, about 4 o'clock P. M. The morning of that day was clear, with north-west wind. In the course of the forenoon it became overcast. From 12 to 4 o'clock in the afternoon, it was calm. Immediately after the shake it commenced, and continued for three hours, snowing copiously, with a gentle north-west wind, when it cleared off. The 5th and 6th were fair; but in the evening of the latter it became overcast, hazy and smoky, and continued so through the night. The south-east wind blew on the 6th; the morning of the 7th, after the great earthquake, was calm; in the afternoon the wind, attended with snow,

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recommenced, and continued through the night. At the time of the shocks of that night, which were of the second class, it was snowing copiously. From the 10th to the 17th, during which two or three slight shocks occurred, the weather was various. On the 21st, 22d and 23d, shocks of the third class were felt: the 21st was clear, with a north-east wind; the 22d was in the same way; on the 23d it was nearly calm, and inclined to rain. On the 3d, 5th, 10th and 11th of March, shocks of the third class occurred: the 3d was clear in the forenoon and hazy in the afternoon, with north-east wind; the 5th was hazy and smoky, with south-west wind; the 10th was clear, with north-east wind; on the 11th, the wind was south-west. April 30th, when a shake of the same violence occurred, was rainy, with north-east wind. A similar shock was felt on the 4th of May, which was variable, with north-east wind in the forenoon and north-west in the afternoon. The 10th, when a vibration of the same kind was experienced, was cloudy, with north-west wind, ceasing at night.

It is unnecessary to continue these details any longer; from what has been given, the following conclusions are deducible:

1. The principal shocks were preceded by an increase of atmospheric heat.

2. They were preceded and succeeded by a *south-east* wind.

3. They were attended with a hazy, turbid or cloudy atmosphere.

4. They, as well as many belonging to the second and third classes, occurred when it was calm, or nearly so, and were succeeded by stormy weather; which was remarkably the case on the 4th of February.

5. The smaller vibrations of the third and fourth classes, happened in various states of wind and weather.

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PREVIOUS EARTHQUAKES.

The shocks of this protracted series are not all which this country has sustained, since it has been the abode of civilized man. We have certain accounts of five others.

The first was in the year 1776. Mr. John Heckewelder, then a missionary of the United Brethren, on the Muskingum river, in this state, has politely favored me with a memorandum concerning it. He does not recollect the month; but it was in the summer, and about 8 o'clock A. M. Its duration was two or three minutes. The south-west side of the house was raised with such violence, that the furniture of the room was nearly overturned. It was accompanied with a subterranean, rumbling noise. Early in the morning the weather was fair, but previous to the shock it began to thicken in the south-west. The cattle were frightened by the shake, and the Indians continued, after it, to apprehend some great disaster, of which they conceived this to be the precursor.

The second shock was in the year 1791 or 1792. I am unable to ascertain the precise time, but think it occurred in the month of April or May, about 7 o'clock in the morning. The weather was fair and mild. The jar was sufficient to agitate the furniture of the house. A rumbling noise in the earth, which seemed to pass from west to east, preceded the shake. It was, I believe, generally felt through the northern and north-eastern parts of Kentucky; but whether beyond them I have not been able to learn.

The third shock occurred, as I am informed by George Turner, Esq. about 3 o'clock A. M. January 8th, 1795, at Kaskaskia, Illinois Territory. It was also, I believe, felt in some parts of Kentucky. Its duration he estimates at a minute and a half. Its direction was nearly west and east. A subterranean noise attended, resembling that of many carriages driven rapidly over a pavement.

A fourth shock was experienced, we are informed by Professor Barton,* at the Falls of Niagara, about 6

* Philadelphia Medical and Physical Journal, vol. i.

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o'clock in the morning of the 26th December, 1796. It appeared to come from the north-west, and did not last more than two seconds; but was sensibly felt for 60 miles round the Falls.

The fifth and only additional shock, of which I have been furnished with any certain accounts, occurred in the southern neighborhood of lake Michigan, at 10 minutes past 2 o'clock P. M. on the 20th of August, 1804. At Fort Dearborn, on the bank of the Lake, it was severe. From the report of captain William Whistler, it must have been a stronger throe than any experienced at this place. It was succeeded by a short hurricane from the Lake. At Fort Wayne, lying considerably to the east-south-east, it was less violent. John Johnston, Esq. my informant, remarks, that the day, at that place, was clear and warm, without any unusual appearance. The general course of the earthquake was undoubtedly that of a line passing through those two forts.

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AURORA BOREALIS.

On Sunday the 17th of April, 1814, soon after dark, an *aurora borealis* became visible at this place. It was directly in the north, the centre moving occasionally to the west or to the east. It extended 50° or 60° along the horizon, and rose from 10° to 15° above it. The upper part was most luminous, and now and then faint obtuse flashes of light were sent upwards several degrees higher. At length an arch was formed over the bank of light; its most elevated part was nearly on the meridian, and mounted upwards about 40°, sending dim and slow corruscations to near the zenith. The ends of this arch were, by estimation, 140 degrees asunder. It was composed of luminous spots, which appeared and disappeared alternately, in different parts, for more than half an hour; when, together with the bank of light near the horizon, and the obtuse corruscations, they gradually evanished.

The greatest illumination was from about half past eight to half past nine o'clock. The light was white, with a slight tinge of red. Stars were, as usual, visible through it. The brilliance was not such as to cast shadows on the surface of the earth. The preceding day was temperate, with a pretty strong breeze, commencing to the south-west, and veering in the afternoon to the north-west. During the aurora it was calm. The day and evening both, were clear. Next morning the sky was somewhat hazy and cloudy, with a north-east wind, which produced rain in the evening. For some time afterwards, the weather was remarkable for thunder storms and wind. On the 20th of the same month, a tornado laid waste a slip of country between this town and Chillicothe; and about the same time another, of great violence, was experienced, 60 miles further south, in the state of Kentucky. Both were attended with hail. And on the 4th of May, there was an extraordinary hail storm in this county, the description of which has been already given in the second chapter.

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On the 11th of September 1814, there was an *aurora borealis*, which continued visible at Cincinnati from dark until near midnight. It was a bank of pale light, in the northern horizon. From this bank, in the course of the evening, there ascended corruscations of the same color, to 80° or 35°. These were sometimes single; at other times numerous, parallel and inclined a few degfees to the meridian. At one period, this group or phalanx exhibited the appearance of an arch, having its extremities terminated in the horizon, and in its construction resembling a vast colonnade, without bases or capitals. Two or three times I observed, for a moment, a short horizontal streak of fire-red light.

Shooting stars were unusually numerous in the north, the only part of the heavens noticed. Stars were, as usual, visible through the aurora. There was a cloud in that direction, but its situation was evidently on this side of the meteor. Other clouds lay in the north-east; and the whole exhibited frequent flashes of vivid lightning, without thunder, which added much to the grandeur of the scene. The atmosphere was calm and temperate. The barometer at 29.55, which is above the mean height at this place.

These are, perhaps, the only unequivocal instances of the aurora borealis, observed in this country since its settlement; and altho' in no degree comparable with the brilliant illuminations so often seen heretofore in the Northern States, they were, from their novelty, highly interesting.

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SOUTH-WEST WIND.

The ingenious C. F. Volney spent the summer of 1796 on the Ohio. During this residence, he seems to have been particularly attentive to our climate; and the results of his observations on the south-west wind, constitute one of the most entertaining chapters of his VIEW. In the language of Professor Mitchill, they are the marrow of all he has written on the climate of the United States. His theory, briefly expressed, is this:— The trade wind of the Atlantic ocean enters the Gulph of Mexico, during our summer months, through the strait formed by the island of Cuba and the peninsula of Yucatan; but its progress to the west, is soon prevented by the mountains of Honduras and Nicaragua; in consequence of which it is accumulated in the Gulph, and at length escapes in different directions, and through various channels. One of these is the valley of the Mississippi, along which the condensed atmosphere of the Gulph, for ten months out of twelve, forces its way, to be distributed over the great region which gives origin to that river. I shall not transcribe the arguments and reasonings of Mr. Volney, as his book has such a general circulation in the United States; but proceed to the statement of my reasons for doubting the correctness of his theory, which shall be done with all possible brevity.

1. In the second chapter of the preceding work, I have endeavored to show, that the south-west wind of this country is of two kinds; which are denominated the wet and the dry. The former, there is much reason to believe, comes from the Gulph of Mexico, and is a volume of intra-tropical air, gravitating towards the poles in the manner suggested by Dr. Hadley. It sinks the barometer, swells the hygrometer, and prevails throughout the night, with clouds and rain. But the the dry south-west, has little or no effect in the barometer, shrinks the hygrometer, and prevails only in the day, with a sky generally clear. Hence there is much reason for assigning to them different causes, and dis-

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tinct sources; and consequently for believing that the latter is not from the Gulph.

2. The trade wind does not cease at night, but the dry south-west invariably terminates at evening, unless rain be approaching; when the humid south-west succeeds to it, and continues the current, with its own peculiar qualities. But *if* the trade wind had nocturnal intermissions, it could not account for the evening suspension and morning revival of the south-west wind of this country. It requires several hours for a column of air to pass from the Gulph to the Ohio, and it would be impossible that the succeeding day's wind, in these vallies, should result from the sun's action on the Gulph the preceding day; as the wind seems to commence, over the whole of this country, nearly at the same time.

3. From a journal of the winds at Baton Rouge, in the state of Louisiana, kept at my request by Dr. C. R. French, from the 5th of September to the 12th of October 1811, it appears that the south-west wind prevailed at Cincinnati, during that period, for thirteen days, when it was not felt at the former place; and occurred there on two days, when it did not blow here. And from another register of the winds, kept by Mr. D. C. Wallace, on a voyage to New-Orleans in the months of November and December, it is ascertained, that the same wind prevailed here for six days, when a different wind blew on the Mississippi.

4. On the afternoon of the 17th September, 1811, there was nearly a total eclipse of the sun. At Cincinnati the day was fair, with a brisk arid south-west. As the obscuration increased, the wind died away; and abated entirely before the eclipse was at its maximum. After it was past, the wind gradually revived, and continued till sun set, when it ceased, as usual. Now, did this wind depend on a centrifugal power acting over the Gulph of Mexico, its operation certainly could not have been suspended by the temporary absence of the sun's influence on this country.

5. If this wind depended on the action of the sun upon the atmosphere of the northern tropic and the Gulph, it would of necessity be most prevalent when

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that action is greatest, viz. in July and August; but this is by no means uniformly the case. It often prevails more in September than any other month. Even in October, when the sun is vertical to places beyond the eastern promontory of South America, this has continued to be the prevalent wind along the Ohio. And for a week before, and two weeks after the summer solstice, I have known this wind to blow here but five days.

6. According to Mr. Volney's own statement, the atmosphere of the Gulph, from sending out immeasurable quantities of air along the slopes of the Mississippi, must need a corresponding supply from the *north-east*, and hence the frequency of north-east storms along the sea board of the Atlantic states. If this were true, how could it be reconciled with the theory which requires that region to be crowded and condensed with air from the south-east, before it can emit any to the north-east? If the south-west wind be only the superfluous air of the Gulph, it can continue no longer than till such superfluity is expended; which will be, whenever the density of the atmosphere of that quarter (provided it ever have any unusual density) is reduced to that of the adjacent continents. A fountain will cease to overflow, when its surface is reduced to the level of its banks; and it is the property of an elastic body to return when bent, but not to become permanently crooked the other way. If air be accumulated and condensed over the Gulph by the trade wind, its elasticity may cause it to escape in the different directions assigned by Mr. Volney; but it can only continue to escape until the equilibrium of density is restored. Its centrifugal tendency must necessarily cease, long before any vacuum is produced.

7. But it appears to me that Mr. Volney has failed to prove that the trade wind produces an accumulation of air in the Gulph of Mexico. The fundamental position in his theory is, that the mountains to the west of the Gulph *mechanically* obstruct and turn back the trade winds; but for which, they would pass into the Pacific ocean. In the progress of the enquiry, however, he seems to forget this, and speaks of the deflected

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trades ascending and passing over the mountains of the United States and of Mexico. That an ærial current can possess more momentum after, than before deflection, is at least paradoxical. But an author's abandoning a theory, does not prove it incorrect; and I will proceed to enquire—whether the trade wind be obstructed by the mountains of Darien? This wind is caused by the superior action of the sun on the torrid zone. The point to which that luminary is vertical, is a focus of suction, which moves from east to west, giving the wind unceasingly a similar direction. It therefore depends on an attracting, rather than a propelling power. It is in some degree analagous to the stream produced by lowering the walls of a cistern, instead of augmenting the volume of the water which it contains. It results from the law which gives all fluids a tendency to preserve an equilibrium; and could the equilibrium be restored over the surface of the ocean, the wind would cease. But this cannot be. The particles of air which have flown in obliquely from the north and the south, to replace those which ascended, are themselves at length rarefied, and ascend gradually during their progress westward. In those parts of the ocean which are remote from land, and between the tropics, this operation is perpetual. But the intervention of land effectually destroys the process. The rarefied tract no longer being produced, the currents dependent on it cease. Thus we find even islands, between the tropics, are without this constant flux, and exhibit either regular land and sea breezes, or a system of winds as various and capricious as those of the continent; and thus the mountains to the west of the Gulph of Mexico, by not favoring the generation of the rarefied focus, on which the trade wind depends, put an instantaneous stop to that current. Mr. Volney's notions concerning our south-west wind, appear to have been suggested by the established theory of the Gulph stream. That a perpetual current of air, from Africa to America, can heap up the waters in the Gulph of Mexico, and cause a reflux, is unquestionable. Such a wind is to the waters a *propelling*, an *a posteriori* power. The

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aqueous surface is unceasingly *driven* forwards. But the wind itself is not caused by a propelling agent: it is simply an effort to restore the equilibrium, which has been destroyed by the action of the sun, and must cease whenever that effect is produced, or the destruction of equilibrium ceases. Hence between the causes of these two currents, there is not the analogy which Mr. Volney supposed. To sum up the whole—the aqueous is the effect of the ærial current; which results from the rarefying action of the solar rays: the interposition of a mound will cause the former to become retrograde, or flow off laterally to find its level; but the same interposition must necessarily terminate the latter altogether, by destroying its cause. If it should be asked—are there not columns of air behind, that may continue to arrive and become accumulated against the mountains of the isthmus? It may be answered, that heated air is not prone to horizontal, but vertical action; that those particles which, in the middle of the Atlantic ocean, for instance, have a horizontal direction, become at length so much warmed and rarefied, that they begin to ascend; and that before they reach the Gulph, they mount into the higher regions of the atmosphere, and flow off towards the poles. That those particles which in the centre of the Gulph have a similar direction, ascend likewise by the time they arrive at its western shore; and consequently, that a perpetual wind may set towards the rampart of the isthmus, without impinging on it.

These facts and arguments, it appears to me, invalidate Mr. Volney's theory, if they do not subvert it; and justify our withholding from it an expression of assent, altho' they furnish data for no other. This indeed is not my object; and the only suggestion which I shall hazard, is, that our arid south-west wind seems to be produced by the direct action of the sun on the surface of the continent, instead of the ocean; but in what manner such an effect is produced, I shall leave for the consideration of the philosophical meteorologist.

THE END.

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ERRATA.

Page 41 line 2 from bottom, for "*east*," read west.
—— 77 —— 5 —— ——— —— "*specimen*," read species.
—— 94 —— 5 after the table, for "*month*," read winter.
—— 136 —— 7 from bottom, for "*Fourth*," read Walnut.
—— 208 —— 2 —— ——— —— "*are*," read is.
—— 216 —— 2 of the first note, for "*confirming*" read strengthening.

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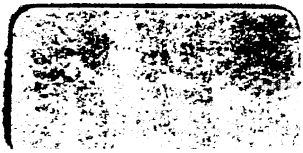
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